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Sanitation

Progress in meeting the goals, targets and commitments of Agenda 21, the Programme for the Further Implementation of Agenda 21 and the Johannesburg Plan of Implementation

Report of the Secretary-General

Summary

During the 1990s, improved sanitation reached an additional one billion people in developing countries. Two billion more will need to gain access between now and 2015 if the international sanitation target is to be reached. This will require an approximate doubling of sanitation investments from the levels of the past decade to $7 billion a year in sanitation infrastructure alone. A multiple of that amount would be required to build adequate wastewater treatment capacity. With rapid urbanization and increasing urban population densities in much of the developing world, such costly investments will prove difficult to avoid if safe drinking water supplies are to be secured. Relatively low cost sanitation technologies exist, even for densely populated urban communities. Like other long-lived infrastructure investments, sanitation facilities need to be designed not just for current but for expected future demand, and they must be reasonably simple and cheap to operate and maintain throughout their useful life.

There is growing recognition that hardware investment needs to be complemented by programmes to raise awareness and promote improved hygiene and sanitation, particularly in schools. Women need to be integrally involved in sanitation planning, as they are usually most directly responsible for instilling habits of good sanitation and hygiene. They also bear a heavy burden from high infant and child mortality.

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The challenges of providing adequate sanitation are greatest in rapidly growing informal settlements, often located on the outskirts of the developing world's cities. Here, insecurity of tenure can hamper public investment in sanitation infrastructure. High population density combined with severe poverty creates a high-risk environment for the spread of disease. At the same time, in certain cultural contexts, the proximity of such communities to rural areas may open profitable opportunities, e.g., to use ecological sanitation technology to manage and treat human waste, removing pathogens before making it available as a nutrient to surrounding farmlands. Given the relatively heavy emphasis to date on water supply, the low sanitation coverage rates in much of the developing world, and the potentially large social benefits of proper sanitation and hygiene, these may deserve a higher priority among Governments and international donors in the future.

Contents

		Paragraphs	Page
I.	Introduction	1–9	3
II.	Access to sanitation services	10–34	5
	A. Urban sanitation	17–20	8
	B. Rural sanitation	21–25	9
	C. Sanitation infrastructure and facilities	26–30	11
	D. Equity and gender considerations	31–34	13
III.	Sanitation and wastewater treatment in integrated water resources management	35–49	13
	A. Wastewater treatment	35–38	13
	B. Wastewater reuse	39–44	14
	C. Monitoring water quality and sanitation	45–47	16
	D. Humanitarian emergencies and natural disasters	48–49	17
IV.	Means of implementation	50	17
	A. Financing	50–55	17
	B. Capacity development	56–62	20
	C. Policy-making and participation	63–70	21
	D. Education and awareness-raising	71–74	22
V.	Lessons learned and continuing challenges	75–88	23

I. Introduction

1. The present report reviews the state of implementation of the commitments, goals and targets on sanitation agreed upon in Agenda 21,[1] the Programme for the Further Implementation of Agenda 21,[2] Commission on Sustainable Development decision 6/1 on freshwater management and sanitation[3] and the Johannesburg Plan of Implementation of the World Summit on Sustainable Development.[4] The report also reviews the constraints and obstacles that countries have faced in the implementation of these goals and targets, and reflects on continuing challenges in the further implementation process. At its twelfth session, the Commission will conduct the first review of sanitation as a stand-alone topic by an intergovernmental body.

2. The focus of this review is on the collection and disposal of human wastes and the treatment of wastewater containing human wastes and other pollution with the aim of protecting human health and the environment. The report has been prepared on the basis of information provided in country reports and in reports by United Nations agencies and other international organizations. Some conclusions from regional and subregional meetings and activities have also been included. Issues relating to the management of solid waste are dealt with in the report of the Secretary-General on human settlements (E/CN.17/2004/6) and toxic chemicals and hazardous waste are discussed in the overview report (E/CN.17/2004/2).

3. The report reviews in particular on the progress made and challenges encountered in the implementation of the following goals and targets:

(a) To halve, by the year 2015, the proportion of people who do not have access to basic sanitation;

(b) To ensure, by the year 2025, that sanitation coverage is achieved in all rural areas;

(c) To improve sanitation in public institutions, especially schools;

(d) To promote safe hygiene practices;

(e) To promote affordable and socially and culturally acceptable technologies and practices;

(f) To integrate sanitation into water resources management strategies;

(g) To develop innovative financing and partnership mechanisms;

(h) To strengthen existing information networks.

4. The following are the primary sources of data and information used in the present report:

(a) Country reports and national assessments submitted by national Governments to the Commission secretariat;

(b) Monitoring information on water supply and sanitation from the Joint Monitoring Programme of the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO), and other reports and contributions from those and other United Nations agencies, including the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), the World Bank and the International Strategy for Disaster Reduction;

(c) Regional assessments prepared by United Nations regional commissions;

(d) Report of the task force on water and sanitation of the Millennium project.

5. The target to halve the number of people without access to basic sanitation by 2015 was defined for the first time at the World Summit on Sustainable Development, where access to sanitation was brought to the centre of the "poverty eradication" commitments.[5] It is an ambitious target, requiring the extension of coverage to an additional 2 billion people by 2015, roughly evenly divided between rural and urban areas.[6]

6. The rationale for including sanitation together with water supply in the Millennium Development Goals is clear. First, in many instances, clean drinking water supplies cannot be secured without adequate attention to sanitation, since human excreta remains one of the most serious sources of drinking water contamination. Second, water- and sanitation-related diseases remain among the biggest killers, especially of children. Mortality from diarrhoeal diseases declined from 4.6 million in 1982 to 1.8 million in 2002, mainly as a result of child survival programmes and oral rehydration therapy,[7] but it is still higher than mortality from tuberculosis and malaria.[8]

7. Despite this relative success in reducing child deaths, child diarrhoeal disease has not decreased significantly and remains one of the most important health problems worldwide. Lack of sanitation and poor hygiene are responsible for the transmission of diarrhoea, cholera, typhoid and several parasitic infections. Moreover, the incidence of these diseases and others linked to poor sanitation — e.g., roundworm, whipworm, Guinea worm and schistosomiasis[9] — is highest among the poor, especially school-aged children. These diseases have a strong negative impact on the health and nutrition of children and their learning capacities, and contribute to significant absences from school.[10] Trachoma can have far more devastating consequences, often leading to blindness. Women also suffer physically from having no accessible and safe toilet facilities, as they often wait until nightfall to defecate in the open — but this practice commonly causes gastric disorders.

8. The adverse impacts of poor sanitation can extend well beyond the direct impacts on health. Health risks and epidemics from waterborne diseases can greatly reduce tourism and agricultural exports, with economic costs much greater than the cost of investments in water supply and sanitation to address the problems.[11]

9. The benefits of sanitation systems and hygienic behaviour accrue largely to the wider community owing to reduced risk of transmission of infectious and parasitic diseases, more than to the individual. This contrasts with safe drinking water supply, whose benefits are mostly captured by the individual user (although water access also facilitates good hygiene). As a result, individuals are more likely to invest in, or demand public investment in, drinking water than in sanitation. Reflecting this demand, Governments in developing countries tend to invest more heavily in water supply than in sanitation.[12]

II. Access to sanitation services

10. While the Johannesburg Plan of Implementation and the sanitation-related Millennium Development Goals refer to the provision of "basic sanitation", the most widely used internationally comparable data[13] — as reported by the Joint Monitoring Programme of UNICEF and WHO — are for "improved sanitation".[14] Thus, the ensuing analysis uses the Joint Monitoring Programme terminology and data. Access to improved sanitation was extended over the 1990s to an additional 1 billion people worldwide, almost all in developing countries, raising the coverage rate from 51 per cent in 1990 to 61 per cent in 2000.[15] Progress has been made in both urban and rural areas: in urban areas, sanitation coverage increased from 80 to 84 per cent (representing an additional 573 million people), while in rural areas it rose from 29 to 40 per cent (an additional 436 million people). Even so, owing to population growth, the absolute number of unserved people declined only slightly, from 2.57 billion to 2.36 billion (table 1). In sub-Saharan Africa, the coverage rate declined slightly and in Oceania rather steeply (albeit from a high level), in East Asia coverage more than doubled and in South-Central Asia it increased by almost three quarters. While Asia remains the region with the lowest coverage, it is rapidly closing the gap with other developing regions. Figure 1 shows the distribution of the unserved population by region in 2000, and figure 2 indicates the population by region that would need to be served with improved sanitation in 2015, allowing for population growth, to meet the sanitation target of halving the proportion of the population without access in each region.[16]

Table 1
Percentage of people with access to improved sanitation facilities

	1990 coverage (percentage)			*2000 coverage (percentage)*		
Region	*Total*	*Urban*	*Rural*	*Total*	*Urban*	*Rural*
Global	51	80	29	61	84	40
North Africa	79	94	65	89	96	82
Sub-Saharan Africa	54	76	46	53	75	42
Latin America and the Caribbean	72	85	41	78	86	52
South-East Asia	53	73	44	65	80	56
South-Central Asia	22	52	11	38	70	25
Eastern Asia	18	56	2	44	70	28
Western Asia	81	95	57	84	97	60
Oceania	83	92	80	75	87	71
Europe	100	100	100	95	99	84

Note: Other developed countries have 100 per cent coverage in both years and are not shown.
Source: www.ssinfo.org/en.

Figure 1

Regional distribution of population not served with improved sanitation (2000): percentage of global total

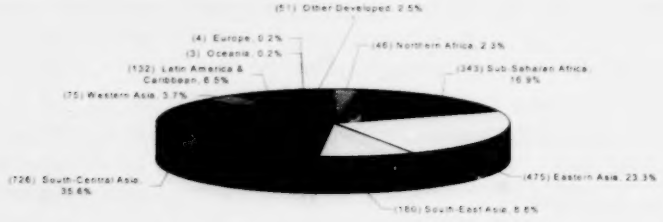
(millions of people in parentheses)

(16) Northern Africa, 0.7
(8) Europe, 1.6
(2) Oceania, 0.1
(31) Western Asia, 1.3
(116) Latin America & Caribbean, 4.9
(185) South-East Asia, 7.8
(911) South-Central Asia, 38.6
(303) Sub-Saharan Africa, 12.8
(761) Eastern Asia, 32.2

Figure 2

Population to be extended access, 2000-2015, to meet sanitation Millennium Development Goals: percentage of world total needing access

(millions of people in parentheses)


(51) Other Developed, 2.5%
(4) Europe, 0.2%
(3) Oceania, 0.2%
(46) Northern Africa, 2.3%
(132) Latin America & Caribbean, 6.5%
(343) Sub-Saharan Africa, 16.9%
(75) Western Asia, 3.7%
(726) South-Central Asia, 35.6%
(475) Eastern Asia, 23.3%
(180) South-East Asia, 8.8%

Sources: Figures 1 and 2 are based on data from the Joint Monitoring Programme web site (www.wssinfo.org/en/welcome.html) and *World Population Prospects: The 2002 Revision* (United Nations publication).

11. Definitions of access to improved sanitation differ somewhat across countries and regions. A review of definitions in African countries finds, for example, that of the responding countries, 82 per cent include public or shared latrines in the definition of improved sanitation, whereas the Joint Monitoring Programme does not. While the Joint Monitoring Programme approach reflects a concern that many public latrines are poorly maintained and often constitute a health hazard, the approach of some African countries may reflect a belief that, when properly maintained, these facilities can provide critical sanitation services for poor households.[17]

12. Countries and regions also differ considerably in terms of the type of sanitation most widely available. Many countries in Latin America and the Caribbean have high coverage of water-borne sewerage — 49 per cent of the population, compared with 13 per cent in Africa and 18 per cent in Asia — reflecting both a much higher rate of urbanization and a higher average living standard.

13. Achieving the sanitation Millennium Development Goals will be a major challenge, with an additional 2 billion people needing access by 2015. In terms of the number of people, South-Central Asia and East Asia pose the biggest challenge, with an additional three quarters of a billion people and half a billion people, respectively, requiring improved sanitation by 2015. Sub-Saharan African countries need to provide an additional one third of a billion people with improved sanitation by 2015 to meet the Millennium Development Goals target. The task will be especially difficult in countries where poverty and/or armed conflict are widespread.

14. From an examination of country data reported for 1990 and 2000,[16] certain countries in each region stand out as examples of progress in extending improved sanitation to their populations (increasing the coverage rate by 10 percentage points or more). In sub-Saharan Africa, Chad, Guinea-Bissau, Senegal and Zambia increased access significantly in rural areas, while Ghana achieved significant progress in urban areas. In East and South-East Asia, China more than doubled overall coverage, Viet Nam greatly improved access in urban areas and Thailand achieved almost universal coverage in rural areas. In South-Central Asia, both India and Pakistan more than doubled rural access, albeit from very different starting points. Box 1 below describes two examples of innovative practices in expanding access to sanitation. In Latin America and the Caribbean, Bolivia, Ecuador, Guatemala, Honduras, Nicaragua and Peru substantially increased coverage, particularly in rural areas.

15. However, as shown by household surveys of sanitation practices in Cambodia, Indonesia and Viet Nam, the existence of improved household sanitation facilities does not necessarily imply that they will always be used. In many households with latrines, individuals still occasionally defecate in fields and irrigation canals — which may be located at some distance from the village and latrine site.[18] Public education and information campaigns are also important in encouraging consistent use of sanitation facilities and promoting social norms in favour of their use.

Box 1
Innovative practices in improving sanitation access

There are a number of examples of communities working with local governments, non-governmental organizations or local entrepreneurs to provide low-cost sanitation systems in urban and rural areas of developing countries.

In India, the Sulabh Sanitation project provides sanitation services throughout the country and has grown into a formal private operator while retaining its non-governmental organization character. The municipal corporations in Hyderabad (population 5.2 million) and in Vijayawada (1 million) have entered into arrangements with Sulabh to supply pay toilets and/or subsidized toilets in slums. The community toilet complexes built and maintained by Sulabh International have significantly improved the surrounding environment, particularly in public places such as markets, bus stations and railway stations.

Bangladesh has adopted a community-based approach for building and improving sewage systems. The Secondary Towns Infrastructure Development Project is a participatory initiative with municipalities and non-governmental organizations, involving the installation of dustbins, twin pit latrines and shelters, and public toilets with biogas generators to cover 21 municipalities.

Source: United Nations Millennium Project Task Force on Water and Sanitation, February 2003, "Achieving the Millennium Development Goals in water and sanitation: background issues report", New York; Bangladesh country report submitted to the Commission.

16. In 1995, a survey of 14 countries found that many primary schools could not provide more than one latrine per 50 students, and that none of the surveyed countries had increased the number of school toilets by more than 8 per cent since 1990.[19] These findings confirm the general conclusions of the School Sanitation and Hygiene Education Programme (launched in 2000), which finds that the sanitary conditions of schools in both rural and urban areas in developing countries are often appalling, creating health hazards.[20] The Wash in Schools campaign, launched in 2003 by UNICEF and the Water Supply and Sanitation Collaborative Council, aims to provide water and sanitary facilities in schools to improve health and encourage girls to attend school.

A. Urban sanitation

17. In order to meet the sanitation target in urban areas, an additional 1 billion people would need to gain access to sanitation facilities by 2015,[21] taking into account population increase. The situation is particularly serious in peri-urban and informal urban settlements, where coverage is extremely low and untreated human waste threatens the water supply and human health.

18. In the coming decade, rapid urbanization will add greatly to the need for urban sanitation services in developing countries. Already in Asia, some 330 million people (almost one in every four urban-dwellers) lack access to improved sanitation facilities, accounting for 73 per cent of the world's unserved urban population. Thus, particular effort will be needed in that region.

19. Regions where large cities are growing rapidly are also those with low coverage of conventional sewers. Africa and Oceania have very low rates of sewered systems, while the industrialized regions of Europe and North America have high rates. Latin America and the Caribbean and Asia lie between them. Asia has done better than the other regions of the developing world in extending use of septic tanks and pour-flush systems. Septic tanks are also widely used in Oceania, where on average they serve nearly half the population of the largest cities, and in Latin America and the Caribbean, where they serve one quarter. In the large cities of Africa, septic tanks are not as common, and a larger proportion of the population uses pit latrines or ventilated improved pit latrines than in other regions.

20. There are cities in Asia and Oceania that could make greater use of dry pit latrines, particularly in settlements where the water supply is limited, expensive or unreliable. On the other hand, in parts of Africa and in Latin America and the Caribbean there is an unexploited potential for the use of pour-flush toilets, which can give a service that is aesthetically little different from a flush toilet, at a lower cost.

B. Rural sanitation

21. In order to meet the sanitation target in rural areas, improved sanitation services would need to be made available to an additional 1 billion rural people by 2015, representing a rate of increase almost double that of the 1990s.[22] In rural areas, it is the existing unserved population that needs to be covered, while in urban areas the increase is overwhelmingly owing to additions to the urban population — whether from natural increase or from in-migration.

22. The degree of imbalance between urban and rural coverage varies across regions. It is highest in South-Central Asia, where an urban resident is almost three times more likely to have access to improved sanitation than a rural one. In East Asia the figure is 2.5 times, while in sub-Saharan Africa it is 1.8 times. Large as the urban-rural coverage gap is, it was much smaller in 2000 than it was in 1990. For South-Central Asia, for instance, the 1990 urban coverage rate was almost five times the rural one. More strikingly, in East Asia the urban coverage rate in 1990 was more than 25 times the rural one. Thus, the biggest 1990s sanitation success story was the extension of rural coverage to an additional 213 million people in East Asia (more than a twelvefold increase). By contrast, in sub-Saharan Africa, the number of rural people covered by improved sanitation increased only slightly during the 1990s, by 16 million people, or 10 per cent. Achievements in Guinea, India and Thailand in expanding rural access to sanitation are described in box 2.

Box 2
Good practices in rural sanitation provision

In **Guinea**, the 1999 demographic and health survey found that 5 per cent of the population had acceptable sanitation and 51 per cent had no access to latrines at all. The programme for rural sanitation in upper and middle Guinea has brought about dramatic improvements in terms of family latrines and public latrines. Large improvements at the household level became possible in 1997 with the introduction of sanitary platform latrines, which were provided to some 1.5 million people (20 per cent of the population). An evaluation carried out in 2000 led to training of community leaders and rural authorities on the necessity of hygienic latrines and sanitary practices, and training of village masons to build the latrines. The rural authorities handle local management. A water sampling in 2000 found 69 per cent of samples entirely free of coliform bacteria, compared with 48 per cent in 1998. Significant improvements in standards of living have been possible with simple sanitation improvements.

In **India**, the Medinipur Intensive Sanitation Project in West Bengal involves a partnership between a multilateral agency, State and district governments, a religious non-governmental organization and voluntary grass-roots organizations. The project mobilizes the community through the delivery of sanitation messages and supports households to invest in on-plot latrines. While external funding was used to support technical innovation, participatory research, hygiene education and social marketing, direct funding of hardware was not included; households invested their own money, making use of small private providers to construct latrines. In the course of 10 years, roughly 1.2 million latrines have been delivered through the programme throughout West Bengal, increasing sanitation coverage from almost zero to 80 per cent.

In **Thailand**, for the past 40 years, the rural environmental sanitation programme has been integrated into the country's five-year economic and social development plans. By 1999, 92 per cent of the rural population had access to safe drinking water, and 98 per cent of rural families had built and were using sanitary latrines. As latrine coverage has increased, mortality related to gastro-intestinal diseases has decreased by more than 90 per cent. The programme's success depended crucially upon capacity-building: intensive training of project personnel and technical staff at local and national levels; and social mobilization and community health education conducted by mobile units and village volunteers. Other key components were: the promotion of water-sealed latrines; the provision of supplies, equipment and transport, as well as government-allocated revolving funds for latrine construction; systematic qualitative and quantitative monitoring of progress; awards for achievement; latrines as a residency requirement beginning in 1989; and research and development.

Sources: M. Weglin-Schuringa and O. Guene, "Evaluating rural latrines in Guinea 1998-2001", *Waterfront* (UNICEF 2002), 15:17-20; UNICEF, Sanitation: the Medinipur Story, Intensive Sanitation Project (UNICEF-Calcutta, India, 1994); K. S. Ramasubban and B. B. Samanta, 1994, "Integrated Sanitation Project", Medinipur (UNICEF-India, 1994); T. V. Luong, O. Chanacharnmongkol, and T. Thatsanatheb, "Universal sanitation in rural Thailand", *Waterfront*, 2002, 15: 8-10.

23. Some small island developing States have introduced sanitation programmes for rural areas. Most notable are the countries with economies based on tourism and ecotourism such as the Maldives, Seychelles and Mauritius. In these countries even rural access rates approach 100 per cent. Mauritius reports one of the most integrated sanitation strategies in Africa, encompassing management of sewage, wastewater treatment and reuse, research and cost-recovery.

24. Rural India poses the largest sanitation challenge in the coming decade, followed closely by China. Of a 2000 rural population in India of 730 million, only 15 per cent had sanitation coverage. In the same year, China's rural areas had some 600 million people without improved sanitation. In all of sub-Saharan Africa, there were only 250 million rural people lacking access to improved sanitation. If those two large countries can sustain high economic growth and distribute its benefits widely, they could well achieve the sanitation Millennium Development Goals.

25. A striking aspect of many of the better known "good practices" in the sanitation sector in rural areas is the absence of large-scale public funding. Research in Africa confirms that the role of the small-scale private entrepreneur in sanitation provision is significant,[23] and these findings are backed up by anecdotal evidence of a high degree of self-provision in East Asia. Despite the relatively low level of reported investment between 1990 and 2000, particularly in rural areas, the additional number of people served with sanitation was huge. A rough calculation suggests that the average reported cost of extending sanitation coverage to an additional 1 billion people during the 1990s was around $30 per person. One reason for this might be that much investment was made directly by householders in low-cost technologies.[24] These expenditures may not be fully reflected in official estimates of sanitation investments. New and more cost-effective approaches to sanitation emphasize the role of the household in sanitation investment and hygiene behaviour.

C. Sanitation infrastructure and facilities

26. Sanitation technologies and approaches necessarily differ across contexts, with solutions suitable for low-density rural areas not being suitable for high-density urban ones. Even within urban environments, however, experience points to numerous unsuitable approaches. For instance, a mid-1990s review of sanitation programmes found that they were often narrowly focused on specific technological fixes. Overly stringent technical standards and centralized approaches discouraged low-cost solutions, and insufficient attention was given to influencing household behaviour and investment decisions.[25]

27. A forthcoming multi-agency report on sanitation and hygiene programmes[26] argues the case for a more flexible approach based on local needs and conditions, and making use of indigenous innovations. It argues that sanitation solutions should be based, as far as possible, on what already exists or is commonly used, and what people want and are willing to construct, use properly and maintain. Also, contrasting experience in Cambodia, on the one hand, and Indonesia and Viet Nam, on the other, suggests that where projects fail to offer technical guidance in construction and to develop local supply skills for sanitary fixtures and construction materials, they tend to be less effective in extending coverage.[27] There is concern, however, that some flexible and responsive approaches may focus on immediate

needs and not take adequate account of long-term requirements (e.g., low-cost materials that are less durable and involve high maintenance costs).

28. Experience — in Brazil and Thailand for example — suggests that decentralized sewage collection and treatment systems can prove relatively cost-effective compared with conventional, centralized sewerage systems. Condominial sewers such as those pioneered in the State of Rio Grande do Norte, Brazil, reduce per capita costs of service by replacing traditional individual household connections to a public sewer with a system in which household wastes are discharged into branch sewers, which are then linked to the public sewer via a block connection. While originally developed for a low-income community, the approach has become widespread across a range of communities in Brazil. The Water and Sewerage Company of Brasília and the Federal District started implementing simplified (condominial) sewerage in poor areas in 1991 and now it considers this its "standard solution" for rich and poor areas alike.[28] Transferring the idea abroad, however, has not always been straightforward. For instance, efforts to introduce the same technology in Bolivia were hampered until an externally funded pilot project working with the utility company in La Paz/El Alto was able to demonstrate the applicability of the technology. This resulted in a national debate on the need to modify national norms and standards, which were subsequently revised.[29]

29. Another type of innovation involves separation of sewer networks into several smaller systems serving different zones within a city, as in Bangkok. The inner part of the city has been divided into 10 sewerage zones, each with an independent collection and treatment system. Each zone-level project is technically simpler than would be a city-wide project, and the Bangkok Metropolitan Administration has thus been able to implement a more affordable phased investment programme. The total sanitation investment for the 10 zones is lower than the amount that would have been required for a single project covering the entire city.

30. A few countries in Africa have made some progress towards improving flexibility and local innovation. Kenya, for example, has developed new building codes which allow latrines to be built in urban "special development areas" for low-income people. Still, only a limited number of local authorities have adopted the required by-laws or declared "special development areas". Zimbabwe developed the Ventilated Improved Pit latrine, an indigenous technology that has become a standard for low-cost rural sanitation programmes. The latrine, in a variety of guises, has been instrumental in increasing sanitation coverage in many places in Africa and Asia. Despite its success however, its cost is still prohibitive for the poorest families. Recent initiatives to promote simple hygiene interventions through Community Health Clubs have led large numbers of poor households in Zimbabwe to begin to practice safe sanitation even without a Ventilated Improved Pit latrine. This has caused a reassessment of the national approach to sanitation with a renewed emphasis placed on hygiene.[30] South Africa's innovative sanitation policy sets a "performance specification" for sanitation rather than defining technologies, and provides guidelines that lay out the need for both sanitation hardware and hygienic behaviour.

D. Equity and gender considerations

31. The need for improved access to sanitation in all communities, especially in poor areas, is specifically recognized in Agenda 21, which calls for the provision of adequate sanitation and waste services to populations in all rural and urban areas by 2025.[31] It also identifies the need to reduce the heavy workload of women and girl children through adequate sanitation facilities.[32] Investments in sanitation have been less effective than they might have been because, historically, most development institutions have neglected the role of the community and the need for equitable access to services.[25]

32. In most cultures, women are primarily responsible for the management of water resources, sanitation and health at the household level, as well as for childcare and education, but all too often, decisions about the design and location of water and sanitary facilities are made without the involvement of women. The inclusion of women in policy-making, planning and implementation can help ensure that facilities are designed and located to encourage use of the facilities and hygienic behaviour by all members of the family.

33. Latrine design can also inhibit use by small children, e.g. where the pit opening is wide. To address this problem, in Mumbai, India, children's toilets were specially designed to include smaller squat plates, handles to prevent overbalancing, and smaller pit openings into a shallow trench that is flushed regularly.[33]

34. The Water, Sanitation and Hygiene campaign, organized by the Water Supply and Sanitation Collaborative Council, is bringing its message to women and men in over 100 countries. The Council includes United Nations organizations, non-governmental organizations, bilateral donors, institutions and the private sector. International research presented at the World Summit on Sustainable Development demonstrates that washing hands with water and soap significantly reduces the risk of diarrhoeal disease.

III. Sanitation and wastewater treatment in integrated water resources management

A. Wastewater treatment

35. Protection of water quality, particularly in urban areas, requires not only collection of sewage but also purification and disinfection before the water is discharged into rivers, lakes or the ocean. Untreated wastewater that is used for drinking, washing or food preparation is a major cause of disease. Water pollution by household and industrial effluent can also reduce oxygen levels in lakes and rivers, contaminate food supplies, cause toxic algae blooms, kill or harm aquatic plants and animals and degrade aquatic ecosystems. Both Agenda 21 and the Johannesburg Plan of Implementation emphasize the need to prevent water pollution, reduce health hazards and protect ecosystems through wastewater treatment.[34] A particular challenge facing the small island developing States and coastal communities is protecting the marine environment, as well as freshwater sources, from waste and pollution.

36. Wastewater treatment systems may include removal of solid matter (primary treatment), biological digestion of dissolved organic matter and disinfection with chlorine or other disinfectants (secondary treatment) and removal of dissolved nutrients such as nitrates and phosphates and other dissolved pollution (tertiary treatment). It is difficult and expensive for a general wastewater treatment facility to remove heavy metals, pesticides and other toxic chemicals, which can more cost-effectively be eliminated at the source.

37. In developing countries, very little wastewater is treated before being returned to rivers or lakes and little progress is being made in improving the situation. In India, for example, 70 per cent of surface waters are polluted, and in China 54 of the 78 major rivers are seriously polluted with both human and industrial waste. Even in Latin America, where about half of the population is connected to sewer systems, most of the collected sewage is released into rivers and streams without treatment. In many developing countries, the wastewater treatment plants that do exist are inadequately managed and maintained or may be overwhelmed by excessive volumes of water, particularly at times of heavy rainfall, requiring the release of untreated water.[35]

38. The countries of Western Asia face problems of water pollution from domestic, industrial and agricultural sources. Sanitation systems exist in most metropolitan centres of high-income countries, and progress has been achieved in treating wastewater. Still, Lebanon has little proper wastewater or sewage treatment, and only 5 per cent of urban sewage is treated in the Islamic Republic of Iran. Saudi Arabia reports that only 20 per cent of industries have proper water treatment facilities. On the other hand, in Israel, 86 per cent of the wastewater is treated before being discharged to watercourses.

Table 2
Median percentage of wastewater treated by effective treatment plants

Region	*Percentage*
Africa	-
Asia	35
Europe	14
Latin America and the Caribbean	90
North America	66

Source: *Global Water Supply and Sanitation Assessment 2000 Report* (WHO/UNICEF publication) 2000.

B. Wastewater reuse

39. To respond to the challenges of water supply and water resources management, particularly where water is scarce, the international community, in Agenda 21 and the Johannesburg Programme of Implementation, called for the development of wastewater recycling and reuse.

40. Safe reuse of wastewater and excreta falls into two broad areas: the large-scale reuse of treated wastewater, usually for irrigation or industrial use; and reuse of treated excreta for household or local agriculture. In agriculture, wastewater for irrigating non-food crops requires less extensive treatment than wastewater used for food crops. Reuse of wastewater for agriculture is practised in almost all arid areas of the world, and numerous countries have established water resources planning policies based on reuse.[36]

41. In Western Asia, especially in the severely water scarce countries, progress has been achieved in treating and reusing wastewater. Several countries, including Jordan and the Gulf States, have integrated wastewater reuse into their national water schemes, with an emphasis on recycling industrial cooling water and reusing treated municipal liquid waste for irrigation.

42. The United States Environmental Protection Agency suggests that the best water reuse applications in terms of economic viability and public acceptance are those which use treated wastewater in place of drinking water for irrigation, environmental restoration, cleaning, toilet flushing and industrial use. Table 3 gives details of West Asian countries where water reuse is making a significant contribution to total water supply.

Table 3
Countries reporting significant reuse of water

Country	*Year for which data are available*	*Reclaimed water as a percentage of total*
Bahrain	1991	6
Cyprus	1997	11
Egypt	2000	1
Israel	1995	10
Jordan	1997	6
Kuwait	1997	15
Libyan Arab Jamahiriya	1999	1
Oman	1995	2
Qatar	1994	9
Saudi Arabia	2000	1
Syrian Arab Republic	2000	3
Tunisia	1998	1
United Arab Emirates	1999	9

Source: "Guidelines for Water Reuse" (forthcoming), (United States Environmental Protection Agency).

43. Household or local reuse of treated excreta has traditionally been practised in many countries, including China, Mexico, Viet Nam, Yemen and countries of Central America, and has more recently been introduced in Sweden. Such reuse of treated excreta should not be confused with traditional night-soil systems where untreated waste is collected and deposited either on the fields or at a disposal point. Such systems expose those who collect the night soil, among others, to grave health

risks. While generally not promoted by Governments, such systems are still widespread in a number of countries.

44. A modern approach, called "ecological sanitation" (box 3) uses faeces and urine, following treatment through dehydration or composting to destroy pathogens, for improving soil fertility and increasing agricultural production. Ecological sanitation uses very little water and is therefore particularly advantageous for areas of water scarcity. When used properly, these technologies ensure that wastes are treated, prevent pollution of ground- and surface-water bodies, generate a product that can be used locally or sold, and remove the need for water for flushing as in sewered systems.[37] However, where sanitation is not given high priority, there is concern that the introduction of relatively complex technologies involving handling of excreta may have significant health risks, particularly in urban areas.[38]

Box 3
Ecological sanitation in China

Although much progress was made in China during the 1990s, there are still 740 million people, mainly in rural areas, without access to sanitary means for excreta disposal. In 1999, the ecological sanitation (ECOSAN) pilot programme began in three provinces, supported by the Swedish International Development Agency (SIDA) and UNICEF. In China, around 93 per cent of agricultural households use human excreta as fertilizer. Added to this traditional practice is a sanitation facility which allows for the diversion of urine and the treatment of faeces so that the practice can be safe and the facility pleasant to use. In Guangxi county, ECOSAN is promoted as a comprehensive drive for a better village environment, and there are now 100 "ECOSAN villages", and ECOSAN facilities have also been constructed in schools.

The project has successfully demonstrated the viability of ecological sanitation technology, which uses no water, and causes no pollution or discharge. The project has been widely replicated, with government-supported construction of over 20,000 urine-diversion latrines in more than 15 provinces in China.

Source: UNICEF Water and Environmental Sanitation regional analysis, 2002.

C. Monitoring water quality and sanitation

45. The Global Environment Monitoring System (GEMS)/Water Programme of the United Nations Environment Programme (UNEP),[39] a global water quality monitoring and assessment programme, provides information on the state and trends of global inland water quality. The programme works with more than 100 partner countries and counterpart organizations within and outside the United Nations system to build capacity in developing countries for collecting and managing information on water quality. GEMS/Water has recently broadened the scope of its datasets to cover parameters related to wastewater and sanitation, including metals, persistent organic pollutants, water-borne pathogens and micropollutants.

46. Monitoring and assessment systems for water supply and sanitation services are seldom provided adequate resources, from the subnational to the international level. Historically, monitoring has focused on the presence or absence of particular physical facilities, rather than information about the functioning, use and reliability of systems. Monitoring systems that employ a sample survey approach (instead of, or in addition to, self-reporting methodologies) can provide more objective and accurate information, especially regarding hygiene behaviour.

47. Such monitoring is problematic, however, since it requires recording routine behaviour within the household, and little work has been done to develop reliable indicators. Research on hygiene that focuses on behaviour reported by the household often appears to be distorted by respondents' reporting desirable behaviours rather than actual behaviours.[40] On the other hand, a recent participatory assessment of sanitation programmes in Cambodia, Indonesia and Viet Nam has elicited a wealth of information from household interviews about sanitation behaviour before and after the households acquired access to a latrine.[41]

D. Humanitarian emergencies and natural disasters

48. Maintaining access to sanitation facilities in situations of conflict, emergencies or natural disasters can be a major problem. Breakdowns in sanitation systems and hygiene behaviour, often in very crowded situations, can lead to epidemics in conditions of limited health care. Globally there are 40 million international refugees and 100 million people displaced internally from their homes as a result of disaster, civil war and conflict.[35] Such conditions are particularly prevalent in sub-Saharan Africa, where up to one third of the people who die of malaria or cholera are from countries affected by natural disasters, wars and civil strife.[42]

49. The ability to maintain safe drinking water and hygiene in a time of crisis was illustrated by the experience of Orissa, India, in the aftermath of a 1999 super-cyclone, which caused massive flooding and contaminated thousands of tube wells. Despite this difficult situation, the health crisis was less than anticipated, as many people boiled their drinking water. The support of many aid organizations and mobile clinics promoted awareness of public health and hygiene issues.[43]

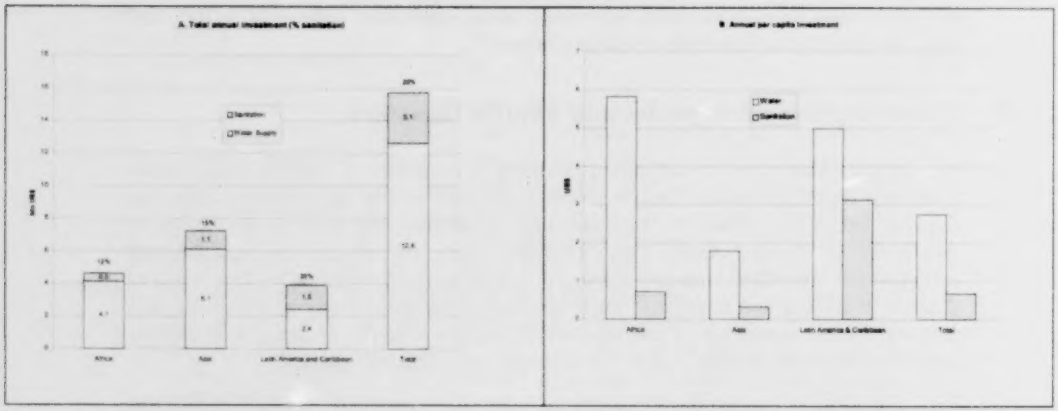
IV. Means of implementation

A. Financing

50. Developing country Governments face difficult choices in allocating limited budgetary resources, with water and sanitation investments competing with health care, education, roads, and other pressing needs. The same applies to donor funding. During the 1990s, only about 20 per cent of the $15 billion annual spending in developing countries on drinking water and sanitation projects has gone to sanitation (see figure 3). On a per capita basis, water supply investments were about 3.5 times larger than sanitation investments. Another $14 billion is invested annually in municipal wastewater treatment in developing countries.[44] By one estimate, close to 70 per cent of water and sanitation spending comes from government budgets, another 20 per cent from international development assistance of members of the Development Assistance Committee of the Organisation for Economic Cooperation

and Development (OECD) (an average of $3.1 billion per year in 1999-2001[45]), and the remaining 10 per cent from the international private sector and community/household investment.[46] Water and sanitation projects represent about 8 per cent of total donor aid commitments. In recent years, a larger proportion of official development assistance for water and sanitation has gone to smaller-scale systems: in the period 1995-1996, out of a total of 900 projects, 100 were valued at over $10 million, accounting for 70 per cent of total funding; in 1999-2000, only 75 out of 1,400 projects were large-scale in this sense, accounting for 60 per cent of total funding.[45]

Figure 3
Annual investment in drinking water supply and sanitation, 1990-2000



Source: *Global Water Supply and Sanitation Assessment 2000 Report* (WHO/UNICEF publication).

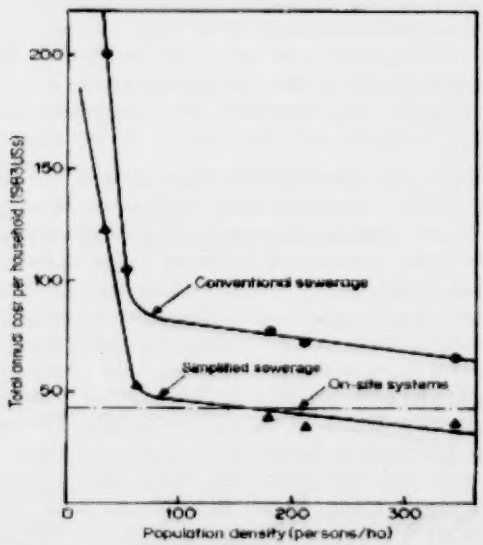
51. The operation and maintenance costs of non-sewered sanitation systems can be relatively large, involving, for example, regular removal and disposal of sludge from latrines and septic tanks and regular cleaning of toilets and latrines. These costs — and how they are to be covered — need to be considered when planning sanitation investments. Poorly maintained systems can actually exacerbate public health problems.

52. Estimates of the costs of meeting the 2015 sanitation target vary widely depending on the levels of service, technology and labour costs. For rural areas, the average investment costs could vary from about $10 per person for improving traditional practices and promoting sanitation and hygiene to $50 for a latrine to $140 for a septic tank system. For urban areas, the average investment costs could vary from about $25 per person for promoting sanitation and hygiene to $120 for a sewer connection with community labour to $160 for a conventional sewer connection. Basic wastewater treatment in urban areas would add about $300 per person, while tertiary treatment would add about $800 per person. The costs vary among regions and countries and the specific technologies used, and the above figures represent averages of costs in different regions in the 1990s.[47] Figure 4

indicates how the most cost-effective sanitation system can depend on population density as well as technology.

53. A very rough estimate of the total global costs of meeting the 2015 sanitation target in developing countries, by expanding access to sanitation for an additional 1 billion people in rural areas and 1 billion in urban areas, using an intermediate cost from the above figures, is about $7 billion per year for sanitation facilities and $53 billion per year for wastewater treatment. This would represent about double the $3 billion per year invested in sanitation facilities in the 1990s and three-and-a-half times the $14 billion invested in municipal wastewater treatment. Annual operation and maintenance is estimated at roughly 15 per cent of investment costs.[47] The $7 billion per year required for sanitation compares with about $26 billion required to meet the 2015 target for increased drinking water supply (see E/CN.17/2004/4).

Figure 4
Relative unit costs of different sanitation options



Note: Costs are for Natal, capital of the State of Rio Grande do Norte, Brazil, in 1983.
Source: Prepared by Leeds University and posted on www.sanicon.net/titles/topicintro.php3?topicId=8.

54. The costs of building urban sewerage systems can be spread to some degree through appropriate system design. For instance, municipal Governments can finance the trunk sewers, providing a single point of connection to neighbourhoods, whose residents assume collective responsibility for laying pipes connecting individual dwellings or other structures. Individual residents bear the costs of installing sanitary fixtures in their own dwellings. To minimize the burden on poor households, payment schemes can spread repayment of investment costs over time, for example by adding them to the monthly water and sanitation utility bills. Alternatively, low-interest loans could serve a similar purpose.

55. Residents of urban slums face particularly serious obstacles to attracting investment in sewerage and water infrastructure. Their lack of land tenure security, combined with uncertainties about the stability of such settlements, acts as a strong deterrent to investment. Public utilities may be discouraged from providing infrastructure so as not to legitimize residents' land claims. Also, fee collection can be difficult in such neighbourhoods, where there may not be any clearly demarcated housing plots and street addresses. Finally, slum residents may find it especially difficult to access formal credit markets for sanitation and other home improvements, given their inability to offer land as collateral.

B. Capacity development

56. Capacity development is needed at the professional and decision-making levels to promote new approaches to the provision of effective sanitation services. This is reflected in the call, in Agenda 21, for greater capacity for maintaining and managing systems to deliver sanitation in both rural and urban areas.[48] This call has not yet been followed by a noticeable increase in funding for technical training in this area. Much of the emphasis of international support in the water and sanitation sector currently appears to focus on integrated water resources management, and sanitation does not seem to feature prominently in any of the international capacity-building programmes (see, for example, the web sites www.cap-net.org and www.gwpforum.org).

57. A positive example is provided by the Inter-American Association of Sanitary and Environmental Engineering (AIDIS), which has been working on capacity-building in North, Central and South America for many years. With member organizations in 13 countries of the Latin America and Caribbean region as well as the three countries of North America, the association focuses on capacity-building in public health, including water supply, waste collection and treatment, air pollution and toxic waste disposal. Its efforts focus on promoting the technical and professional development of AIDIS members and supporting the reciprocal exchange of appropriate technologies and practices. In June 2002, national chapters of AIDIS in seven countries — Argentina, Brazil, El Salvador, Nicaragua, Panama, Paraguay and Peru — sent representatives on a study tour to the United States of America. In 2003, conferences were held throughout the United States and in Colombia, Haiti, Puerto Rico, Nicaragua, Chile, Brazil, Ecuador and Peru. Each national branch is expected to create a technical division in order to facilitate appropriate technology transfer.[49]

58. In Asia, several countries, including Japan, Singapore, Malaysia, Philippines and the Republic of Korea, report undertaking training programmes in the environmentally sound management of wastes. Other countries, such as Myanmar and Cambodia, report underdeveloped human capacities in the sanitation field and requirements for further capacity-building and training in the environmentally sound management of domestic and industrial wastes.

59. North African countries, including Algeria, Morocco and Egypt, have undertaken public campaigns to promote more responsible management of domestic wastes. Tunisia and Egypt report research, training and education activities in the field of waste management. Tunisia, through its international centre of environment technologies, has carried out many studies related to waste management. Mauritius

has diverse courses in management of wastewater offered through the University of Mauritius Faculty of Engineering, and continued staff training in solid and hazardous waste management is reported as a government priority. The Mauritius wastewater management authority supports research projects related to wastewater.

60. In the late 1990s, the Participatory Hygiene and Sanitation Transformation (PHAST) participatory methodology was developed in East and Southern Africa to build the capacity of communities to manage water and sanitation facilities and address hygiene issues, particularly for the prevention of diarrhoeal disease. PHAST toolkits can be used at the local level to guide communities in discussing methods and behaviours to reduce the incidence of diarrhoeal disease.

61. In Western Europe, several countries (particularly the United Kingdom of Great Britain and Northern Ireland) emphasize their cooperation through the European Union Phare assistance scheme for countries of Central and Eastern Europe, which includes wastewater treatment programmes, and the similar Tacis technical assistance scheme for the countries of the Commonwealth of Independent States. Technology transfer and capacity-building assistance to developing countries is highlighted by a few countries, including Austria, Germany, the Netherlands and the United Kingdom.

62. In Eastern European countries, special emphasis is placed on capacity-building and training. The Baltic Environmental Forum is organizing workshops on waste management issues for the environmental authorities of Estonia, Latvia and Lithuania.

C. Policy-making and participation

63. Key policy instruments to increase investment and the effectiveness of sanitation and hygiene have been recognized in international agreements,[50] including calls:

(a) To prioritize sanitation in national sustainable development strategies and regulatory frameworks;

(b) To implement national policies and incentives for waste minimization and improved reuse and recycling;

(c) To assign priority in water policies to ensuring safe drinking water and sanitation, preventing both microbial and chemical contamination;

(d) To enable community ownership of facilities.

64. Few countries have introduced dedicated regulatory and policy frameworks for sanitation. Recognizing the diversity of arrangements that can support effective sanitation investments, international forums have repeatedly called for strengthening of institutional capacity, periodic assessments of performance, and a particular focus on institutional arrangements that serve poor people, without specifying the need for dedicated sanitation or hygiene promotion agencies.[51]

65. Sanitation and wastewater treatment have generally not been adequately incorporated in national integrated water resources management plans or environmental policies. A recent review of the national environmental action plans

of 34 African countries found that while health was often mentioned as a concern, environmental health measures were rarely integrated into development strategies.[42]

66. Sanitation and wastewater treatment have also been generally neglected in poverty planning. A 2001 review of poverty reduction strategy papers[52] in the poorest countries of Africa found that, while sanitation was often cited as a pressing need at the community level, it was not included in national budget recommendations. A follow-up workshop concluded that sanitation professionals had not been adequately involved in the poverty reduction strategy paper process, and that this failing resulted from a lack of understanding of the role of public investment in increasing access to sanitation services.[52]

67. Some countries in Africa, however, do report the incorporation of sanitation into national water policies. Uganda adopted water resources and wastewater discharge regulations in 1998 and integrated sanitation into the national water policy. In Asia, most countries report national regulations and responsible bodies for policy-making on sanitation.

68. Many observers have argued that in sanitation and hygiene, which include intensely personal issues, progress is driven largely by decisions — over investments and behaviours — taken within the household. Single-agency approaches which focus on the delivery of a sanitation "product" may therefore have limited impact, and a single national "sanitation policy" may not be appropriate. Greater importance might be placed on aligning programmes and approaches in other sectors, including primary health care, water supply, urban infrastructure and education, in such a way that they all support improved sanitation and hygiene at the household level.[26]

69. Effective sanitation service delivery requires decision-making and control of resources at the appropriate level, which depends on national and local conditions.[53] Where large utilities provide appropriate services at reasonable costs — as is the case in many industrialized countries, parts of Latin America and other regions, and cities and towns in many parts of the world — local community involvement in the management of services may not be required. In all cases, however, users' interests need to be adequately represented and the risk of regulators' favouring suppliers' interests minimized.[35]

70. The importance of a coordinated approach to sanitation that supports both increased access to hardware for sanitary facilities and improved hygiene education was underlined in Agenda 21 and has been reconfirmed in subsequent international forums.[54] Unfortunately, there is a dearth of information on the extent to which changes in hygienic practices are being achieved. The World Bank carried out a review of its own lending in sanitation in 2000 and concluded that, while hygiene promotion was gaining in prominence, it was still found in only 17 per cent of projects with a sanitation component.[55]

D. Education and awareness-raising

71. An important role for communities in promoting behaviour change has been recognized in repeated calls to support education and outreach programmes (especially focused on children and adolescents), campaigns to encourage active

community participation in management of household waste, and training for women in maintenance of equipment for environmental sanitation.[56]

72. In one promising initiative, in early 2000, the School Sanitation and Hygiene Education programme[57] was launched in six countries: Burkina Faso, Colombia, Nepal, Nicaragua, Viet Nam and Zambia. By 2015, the programme aims to educate 80 per cent of primary schoolchildren about hygiene and to have all schools equipped with sanitation and hand washing facilities. Students are targeted both as direct beneficiaries and as agents of behavioural and attitudinal change within their families and their communities. The programme recognizes the importance of providing hygienic in-school sanitation facilities, taking into account the specific needs of female students.

73. Although there are numerous cases where education, training and outreach programmes have been successful,[58] there is only limited evidence of a shift in emphasis towards stronger community involvement in donor-supported sanitation projects and of higher priority attached to education and awareness-raising relative to infrastructure provision.

74. Much of the sanitation-related advocacy work is being spearheaded by international non-governmental organizations and other partnerships. There are several broad-based networks or partnerships, including the Water Supply and Sanitation Collaborative Council, the Global Water Partnership, the Gender and Water Alliance and the World Water Council and such non-governmental organizations as WaterAid, Oxfam, and Care International, among others. These organizations identify critical needs at global, regional and national levels, help design programmes for meeting these needs and serve as mechanisms for information exchange on water supply and sanitation issues.

V. Lessons learned and continuing challenges

75. The analysis of experience in improving access to sanitation suggests the following conclusions and continuing challenges.

Strategy and policy

76. Improved sanitation is essential to increasing the availability of safe drinking water, reducing disease, improving living conditions in human settlements and enhancing the status of women and girls, but very few countries have incorporated sanitation programmes explicitly into their national development or poverty reduction strategies. While water supply and sanitation often appear together in public statements, sanitation and hygiene tend to be neglected during the planning, policy-making, budgeting, and implementation phases, with the major share of effort and resources being allocated to water supply.

77. Given that many of the health and environmental benefits from improved sanitation accrue to the community at large, rather than to individuals or households, decision-making on sanitation cannot be left entirely to individuals or market mechanisms. Governments and community institutions play an indispensable role in expanding access to sanitation.

78. Sanitation and hygiene are in large part the result of private household decisions, and policies to promote improved sanitation must therefore seek to influence preferences and resource allocation decisions at that level. Governments can promote public awareness of the importance of sanitation and hygiene, provide capacity-building for community programmes, support small-scale providers, provide facilities in public and semi-public areas, and provide trunk sewers and wastewater treatment where needed.

Providing access to improved sanitation

79. **Access in dispersed rural settlements**. Effective demand for improved sanitation in rural communities is often very low, given high rates of poverty, limited institutional support for sanitation facilities, and "traditional" sanitation practices (e.g., defecation in agricultural fields). Education and awareness-raising programmes have to be designed carefully, based on sanitation technologies appropriate to the conditions. Suitable methods of financing sanitation investments also need to be devised — e.g., instalment repayments or contributions in kind (e.g., communal labour).

80. **Access for medium-density communities**. Sanitation planning at the rural-urban interface can be particularly challenging. While households in these communities often appreciate the convenience and status conveyed by toilets connected to sewers, the costs of these technologies may be prohibitive, and on-site facilities may be more cost-effective. It may also be possible to respond to the demand for sewerage service in such communities by adopting lower-cost technical options like condominial sewers or carefully designed and well-managed public facilities. Communities at the urban-rural boundary, with their volume of wastewater and proximity to agriculture, are often good candidates for recycling treated sewage water for agriculture. This practice can recover costs of treating sewage water while generating benefits in the form of irrigation water and fertilizer, but effective and reliable treatment must be ensured, particularly for irrigation of food crops.

81. **Access for high-density urban communities**. Improving sanitation in urban areas is one of the most complex challenges for meeting the water and sanitation targets. Given the high population densities and limited land availability, low-cost on-site technologies are often unworkable and can cause contamination of drinking water supplies. Conventional sewerage systems and wastewater treatment facilities are expensive to construct and maintain and cannot be financed through cost-recovery, particularly in low-income communities. In the past decade, innovative lower-cost approaches have helped reduce the financial barriers to expanding sanitation coverage. Mobilization of community resources — human and financial — can complement public investment in trunk sewers, as in the condominial model pioneered in Brazil. Long-term planning is important for ensuring that new systems are physically sustainable and cost-effective in the long run and for building infrastructure as part of urban development and expansion to avoid more expensive later upgrading of inadequate systems.

82. **Access to sanitation in schools and workplaces**. Just as adults spend much of their day at work away from home, so children spend much time at school. Even if families have sanitation facilities at home, they may not enjoy the full benefits of good hygiene if sanitary facilities are not available in schools and workplaces.

Increased interest in water, sanitation and hygiene in schools to contribute to a safe and healthy learning environment is a positive development and can accelerate progress towards the sanitation target. The lessons learned from various initiatives and programmes in this area provide a basis for replication and upscaling.

Mobilizing financial resources

83. Public funds make up the bulk of financial resources for investment in sanitation infrastructure, as is appropriate given the large social benefits of improved sanitation. Official development assistance has provided an important source of supplemental financing. In recent years, international development assistance for water and sanitation infrastructure has declined somewhat in both relative and absolute terms. At the same time, there appears to have been a shift in funding towards smaller-scale systems — though these still command a relatively small share of sectoral official development assistance resource commitments.

84. The resources invested in sanitation by households are difficult to measure but are thought to be substantial. Non-governmental organizations and community organizations have also mobilized substantial resources for sanitation, for both facilities and awareness-raising. While the international private sector is active in large-scale urban water supply, it is not heavily involved in providing sanitation infrastructure and services — with the partial exception of municipal wastewater treatment. The local small-scale private sector has, however, played a vital role in providing sanitation facilities in many countries, especially in rural areas. Local entrepreneurs can play a critical role in reaching the millions who are yet to be served, in both rural and urban areas.

85. While willingness (or ability) to pay for improved sanitation may not always be sufficient to cover the costs, it can be significant. Even as providers seek to tap the effective demand (actual or potential) for improved sanitation, there is a continuing public-good rationale for subsidizing sanitation, particularly for the poor. Moreover, as ensuring adequate sanitation is a public sector responsibility with large social benefits, particularly for people in poverty, its financing could be a higher priority for official development assistance.

Decision-making and awareness-raising with a gender focus

86. Women's key role in most cultures in shaping hygienic practices within households, in managing domestic water use, and in maintaining sanitation facilities argues for their active involvement in decision-making regarding the design and location of those facilities. Particular concerns include ensuring privacy and security, notably for girls and women and especially in common facilities, and designs that take account of specific needs, e.g., of small children.

87. Education programmes that foster understanding of the links between sanitation, hygiene, and health can contribute to increasing effective demand for improved sanitation. Evidence suggests that hygiene education campaigns are most effective among younger people, and students can be targeted both as beneficiaries and as agents of behavioural and attitudinal change within their families and their communities. Hygiene education in schools needs to be accompanied by the provision and maintenance of improved sanitation facilities at school premises.

Research and surveys suggest that separate facilities need be provided for girls and boys if girls are not to be discouraged from school attendance.

Choosing appropriate technologies

88. Many developing countries have been using technologies, system designs and technical standards that are not well suited to their conditions, as well as treatment processes that are more complex than necessary. Low-cost technologies that are technically simple and cheap to operate and maintain can be, in some contexts, an adequate substitute for more expensive large-scale water-borne sewerage systems. For wastewater treatment, there are also cheaper yet effective alternatives to the standard activated-sludge process. Such simpler technologies, where appropriate, can reduce the financial requirements of achieving the sanitation Millennium Development Goals. With the increased focus on sanitation following the World Summit on Sustainable Development, the United Nations system, other international organizations and non-governmental organizations are increasing efforts to disseminate these technologies and experiences internationally, including through new forms of partnership.

Notes

1 *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992* (United Nations publication, Sales No. E.93.I.8 and corrigenda), vol. I: *Resolutions adopted by the Conference*, resolution 1, annex II.

2 Resolution S-19/2, annex.

3 See *Official Records of the Economic and Social Council, 1998, Supplement No. 9* (E/1998/29), chap. I, sect. B.

4 *Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August-4 September 2002* (United Nations publication, Sales No. E.03.II.A.1 and corrigendum), chap. I, resolution 2, annex.

5 Ibid., para. 23 (a).

6 *Global Water Supply and Sanitation Assessment 2000 Report* (WHO/UNICEF publication). See also www.who.int/docstore/water_sanitation_health/Globassessment/Global3.3.htm. For an earlier commitment to sanitation, see *Vision 21: A shared vision for hygiene, sanitation and water supply and a framework for action* (Water Supply and Sanitation Collaborative Council, 2000).

7 Victora, C. G., Bryce, J., Fontaine, O. and Monasch, R., "Reducing deaths from diarrhoea through oral rehydration therapy". *Bulletin of the World Health Organization, 2000*, vol. 78, No. 10: 1246-1255.

8 WHO, *World Health Report 2003* (WHO publication), annex, table 2; see also Bateman, O. M. and McGahey, C., "Profile: A Framework for Action: Child Diarrhea Prevention", *Global Health Council*, 111, 28 September 2001.

9 "Strengthening interventions to reduce helminth infections: an entry point for the development of health-promoting schools" (WHO publication), 1997.

10 Nokes, C. and Bundy, D. A. P., "Compliance and absenteeism in schoolchildren: implications for helminth control", *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 1993, 87: 148-152; see also Miguel, E., and Kremer, M., "Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities", February 2003, Department of Economics, Harvard University.

11 *Looking back; Looking ahead. Five decades of challenges and achievements in environmental sanitation and health* (WHO publication), June 2003.

12 Task Force on Water and Sanitation, Millennium Project, "Achieving the Millennium Development Goals for Water and Sanitation: What Will It Take?", interim full report, February 2004.

[13] The richness of the Joint Monitoring Programme data has increased over the years. Prior to the 2000 assessment, the main source of water supply and sanitation data were the service providers themselves. Starting with 2000, this source has been complemented by data from household surveys, which should provide a more accurate picture of actual access, including owner-built systems and reflecting the actual functioning of systems.

[14] The terminology used at the World Summit on Sustainable Development is access to "basic sanitation", whereas the term used in the UNICEF/WHO Joint Monitoring Programme report of 2000 is "improved sanitation". In choosing "basic sanitation" as its preferred terminology, the Summit was emphasizing behavioural change as well as technology in improving health and hygiene. The Joint Monitoring Programme data on "improved sanitation" focus on the technology — i.e., on types of toilets and excreta disposal systems to which households have access. In particular, for the Joint Monitoring Programme, improved sanitation refers to the following: connection to a public sewer; connection to septic system; pour-flush latrine; simple pit latrines; and ventilated improved pit latrine.

[15] Joint Monitoring Programme for Water Supply and Sanitation, WHO/UNICEF: data obtained from www.wssinfo.org/en/31_san_intro_en.html. Coverage rates, which generally divide the number of latrines by the number of households, may not always accurately reflect sanitation access and use. For instance, in many communities, two or more households construct and share use of a common latrine.

[16] WHO/UNICEF Joint Monitoring Programme web site (www.wssinfo.org/en).

[17] Water Supply and Sanitation in Africa: How to Measure Progress toward the Millennium Development Goals (World Bank, 2003), paper presented to a Southern African Development Community meeting on Water Supply, Sanitation and Hygiene, Gaborone, 4-7 August 2003.

[18] Mukherjee, N., *Achieving Sustained Sanitation for the Poor: Policy and Strategy Lessons from Participatory Assessments in Cambodia, Indonesia and Viet Nam*, Water and Sanitation Programme, April 2001.

[19] *Progress of Nations* (UNICEF publication), 1997.

[20] Burgers, L., Background and Rationale for School Sanitation and Hygiene Education (UNICEF), 3 November 2000 (www2.irc.nl.pdf/sshe/rationale.pdf).

[21] One possible source of upward bias in the data on urban access stems from the tendency of some providers to report universal coverage in an area where a sewerage system has been built, even though not all households are connected. Also, countries do not systematically record breakdown rates or systems that fall into disrepair.

[22] There is evidence that many households, especially in rural areas, make their own arrangements for sanitation outside formal service provision, and these data may not be fully captured by reporting mechanisms that rely on service providers, though they should be captured by household surveys.

[23] Collignon, B. and Vezina, M., Independent Water and Sanitation Providers in African Cities: Full Report of a Ten-Country Study Water and Sanitation Programme, 2000.

[24] *Global Water Supply and Sanitation Assessment 2000 Report* (WHO/UNICEF publication), p. 17.

[25] LaFond, A., 1995. "A Review of Sanitation Programme Evaluations in Developing Countries" (Environmental Health Project (EHP) and UNICEF), EHP activity report No. 5, Arlington VA.

[26] Water Supply and Sanitation Collaborative Council, United States Agency for International Development, *Sanitation and Hygiene Promotion: Programming Guidance* (UNICEF, 2004) (forthcoming).

[27] Mukherjee, N., *Achieving Sustained Sanitation for the Poor: Policy and Strategy Lessons from Participatory Assessments in Cambodia, Indonesia and Viet Nam*, Water and Sanitation Programme, April 2001.

[28] The Company has over 1,200 km of condominial sewers in operation — the largest example of simplified sewerage in the world.

[29] See www.wsp.org/condominial/indexeng.html.

[30] See Robinson, A., "VIP Latrines in Zimbabwe: From Local Innovation to Global Sanitation Solution. Field Note No. 4 in the Blue Gold Series, Water and Sanitation Programme — Africa Region, Nairobi", 2002; and Sidibe, M. and Curtis, V., "Hygiene Promotion in Burkina Faso and Zimbabwe: New Approaches to Behaviour Change Field Note No. 7 in the Blue Gold Series, Water and Sanitation Programme — Africa Region, Nairobi", 2002.

[31] Agenda 21, para. 21.39.

[32] Ibid., para. 24.3.

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[57] The School Sanitation and Hygiene Education programme is a joint initiative of UNICEF and the International Water and Sanitation Centre (IRC); see www2.irc.nl/sshe/projects/index.html.

[58] There are abundant cases of female masons working successfully in sanitation for example, and a number of projects have been designed specifically to build their capacity. Once trained, such women are often well-accepted and make a successful living, although few rise to senior positions on projects. A good strategy for poor women seems to be the formation of cooperatives that can provide mutual support and help to smooth over periods when work is less abundant. Good examples can be found in Lesotho, India, Sri Lanka, Kerala (India), Zimbabwe, Mozambique, Tonga, Jamaica, Nicaragua, Bangladesh and Nepal.

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Human settlements

Progress in meeting the goals, targets and commitments of Agenda 21, the Programme for the Further Implementation of Agenda 21 and the Johannesburg Plan of Implementation

Report of the Secretary-General

Summary

In the Plan of Implementation of the World Summit on Sustainable Development (Johannesburg Plan of Implementation) and the Rio process, consideration of human settlements focuses on slum improvement, improving access to shelter and public services, municipal waste management systems, improving environmental health conditions, developing sustainable transportation systems and improving economic opportunities, particularly for the urban poor. In the coming decades, almost all of the global population growth will occur in the cities of the developing world and unless Governments take decisive action to encourage expansion of formal low-cost housing developments, most of that growth will be in slum areas. Policies towards informal settlements and other slums have, in recent years, focused increasingly on slum upgrading, with support for land title regularization and greater tenure security.

Access to affordable land can pose a serious obstacle to shelter provision for the poor. Public development corporations can play a useful role in planning ahead for land acquisition to build low-cost housing. Rental housing can be an important complement to owner-occupied dwellings, especially for low-income households at

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certain stages of their life cycles. Government housing subsidies will also continue to play a role, though their reach is often limited. For the poor, who are largely excluded from formal credit markets, microfinance can — and to some extent already does — play a role in supporting incremental improvements to their dwellings, including through investments in water and sanitation.

Access to affordable electricity, communications and public transport and support for microenterprises are critical for improving economic opportunities and integrating slum dwellers into the wider urban economy. Adequate provision for the handling, disposal and/or recycling of solid, including hazardous, waste is needed to minimize risk of disease and serious accident, to which slum communities are often most exposed. They are also especially vulnerable to natural disasters.

There remains a dual challenge: to improve the living conditions of the estimated 900 million people currently living in slums, while anticipating the need to shelter adequately the many million more low-income households that will be formed in or move to the cities and urban periphery of the developing world over the next few decades.

Contents

		Paragraphs	*Page*
I.	Background	1–3	3
II.	Introduction	4–8	4
III.	Sustainable development of human settlements	9–53	5
	A. Improving the lives of slum dwellers	9–13	5
	B. Adequate shelter for all	14–23	6
	C. Access to land and land use planning	24–30	9
	D. Provision of services and infrastructure	31–46	11
	1. Access to energy	33–34	12
	2. Solid waste management	35–41	12
	3. Implementing sustainable transport solutions	42–46	14
	E. Employment creation and enterprise promotion	47–49	15
	F. Human settlement development in disaster-prone areas	50–53	16
IV.	Means of implementation	54–70	17
	A. Finance	54–65	17
	B. Decentralization in decision-making, participation and capacity-building	66–70	20
V.	Lessons learned and continuing challenges	71–85	21

I. Background

1. The present report reviews the state of implementation of human settlement goals and targets in Agenda 21,[1] the Programme for the Further Implementation of Agenda 21[2] and the Plan of Implementation of the World Summit on Sustainable Development (Johannesburg Plan of Implementation).[3] It analyses constraints and obstacles encountered in the implementation of these goals and targets in region-specific settings and identifies continuing challenges. The report, in particular, focuses on progress in the implementation of the following goals, targets and commitments:

(a) By 2020, achieve a significant improvement in the lives of at least 100 million slum dwellers (a Millennium Development Goal reaffirmed in Johannesburg);

(b) Improve access to adequate shelter and services, including water and sanitation, as well as land and property;

(c) Promote an integrated approach to transport services and systems;

(d) Develop waste management systems, with the highest priority placed on reduction, reuse and recycling;

(e) Reduce respiratory diseases and other impacts on health resulting from air pollution;

(f) Increase decent employment, credit and income for the urban poor;

(g) Strengthen implementation through mobilization and effective use of financial resources and human capacities;

(h) Strengthen institutional arrangements and governance.

2. Data and information from the following sources were used in the preparation of the report:

(a) Country reports and national assessments submitted by Governments to the secretariat of the Commission on Sustainable Development;

(b) Reports prepared by the United Nations Centre for Human Settlements (UN-Habitat) on human settlements;

(c) Contributions from the Food and Agriculture Organization of the United Nations (FAO), the International Labour Organization (ILO), the United Nations Development Programme (UNDP), the World Health Organization (WHO) and the secretariat of the International Strategy for Disaster Reduction;

(d) Regional reports submitted by the Economic Commission for Africa (ECA), the Economic Commission for Latin America and the Caribbean (ECLAC), the Economic and Social Commission for Western Asia (ESCWA), the Economic and Social Commission for Asia and the Pacific (ESCAP) and the Economic Commission for Europe (ECE);

(e) The synthesis report of the three regional meetings on the small island developing State in preparation for the 10-year review of the Barbados Programme of Action.[4]

3. While the report includes reference to access to water and sanitation, these issues are not reviewed in detail here as they are addressed in the reports of the Secretary-General on water and on sanitation for the twelfth session of the Commission. Also, while the section on solid waste management makes reference to toxic chemicals and hazardous wastes, those issues are reviewed in more detail in the overview report for the Commission.

II. Introduction

4. Issues relating to the sustainable development of human settlements cut across the whole spectrum of social, economic and environmental issues of sustainable development. Improving human settlements and providing adequate shelter, infrastructure and services for all, with particular attention to improving the lives of slum dwellers, calls for an integrated approach. Improvements in human settlements will depend on, and support, progress in reducing poverty, achieving sustained economic growth and protecting the environment. Such synergies and interlinkages underscore the need for pursuing shelter strategies and slum upgrading policies within the overarching framework of sustainable development.

5. Current trends in urbanization and slum growth underline the critical importance of urban development to sustainable development and poverty reduction in the coming decades. World population is projected to increase by 2 billion people over the next 30 years, and virtually all of this population growth will occur in urban areas of developing countries.[5] Without major changes in current trends, about half of the additional population growth will occur in the urban slums of the developing world, increasing their population to about 2 billion. In South Asia and sub-Saharan Africa, the majority of the urban population currently lives in slums.[6] In the past three years alone, the number of slum dwellers in the developing world has increased by some 70 million.

6. The rapid rise in the number of slum dwellers in the developing world is attributable to both high natural population growth and rural-to-urban migration, propelled by a combination of social, economic and environmental factors. For the rural poor, cities offer opportunities for higher-paying jobs, better services, and an escape from rural poverty. In some parts of the world, notably sub-Saharan Africa, armed conflicts, land degradation and depletion of natural resources are important contributing factors.[7]

7. The rise in slum populations has put the meagre resources of municipal governments under further strain. Urban infrastructure and services have not kept up with the growing populations, leading to an across-the-board overburdening of existing infrastructure. With the rapid spread of informal settlements, often located at the urban periphery, has come a host of urban social problems, including growing unemployment, crime and domestic violence.

8. Improving the lives of slum dwellers requires an integrated approach to address rural and urban poverty as well as the complex contributing factors. Persistent poverty in rural areas continues to drive rural-to-urban migration, indicating that the conditions of life in rural communities, and the linkages between urban and rural populations, should also be addressed as part of strategies for the development of human settlements.

III. Sustainable development of human settlements

A. Improving the lives of slum dwellers

9. Slums, whether run-down inner-city neighbourhoods or peri-urban squatter areas or shantytowns, are characterized by sub-standard housing, overcrowding, insecure tenure and lack of basic services such as safe water, improved sanitation, transportation and electricity.[8] Slums are concrete manifestations of urban poverty and social exclusion. According to UN-Habitat, 32 per cent of the world's urban population currently lives in slum settlements — a total of 924 million people (see table below). While the slum population constitutes 6 per cent of the urban population in developed regions, it makes up 43 per cent in developing regions and 78 per cent in the least developed countries. Assuming no major departure from recent trends, the number of slum dwellers worldwide is projected to rise over the next 30 years to about 2 billion.[9] Viewed against this backdrop, the target of achieving a significant improvement in the lives of at least 100 million slum dwellers by 2020, however commendable, is patently inadequate.

Population of slum areas in developing regions, mid-2001

Region	*Total population (millions)*	*Total urban population (millions)*	*Urban population as a percentage of total population*	*Slum population as a percentage of urban population*	*Urban slum population (millions)*
World	6 134	2 923	47.7	31.6	924
Developing regions	4 940	2 022	40.9	43.0	874
Africa	683	307	44.9	60.9	187
Latin America and the Caribbean	527	399	75.8	31.9	128
Asia	3 593	1 313	36.5	42.1	554
Oceania	8	2	26.7	24.1	5
Least developed countries	685	179	26.2	78.2	140

Source: Global Urban Observatory, *Improving the Lives of 100 Million Slum Dwellers: Guide to Monitoring Target 11* (UN-Habitat publication), May 2003, p. 6.

10. Recent studies indicate that slums are expected to continue to grow in almost all regions in the world. Regional trends suggest that Africa, particularly sub-Saharan Africa, Central Asia, particularly the former Soviet republics of Central Asia, and some countries in Latin America, are most likely to see growth in slum settlements. East Asia, on the other hand, is making impressive progress in reducing slums, thanks to a combination of economic growth, targeted slum upgrading and shelter programmes, and poverty reduction policy.[10]

11. Faced with the prospect of further slum expansion, many Governments have recognized the need for policy changes and innovative strategic approaches to shelter provision. On the one hand, there is need for proactive shelter provision policies and programmes that seek to avert further slum growth by encouraging expansion of low-cost housing stock and associated infrastructure in anticipation of rapidly growing demand. Chile and Costa Rica are examples of countries that have

virtually halted slum growth by supporting formal sector supply of low-cost housing close to the rate of new household formation.[11] Apart from the problem of affordability of land for low-cost housing development (addressed below), numerous studies point to the adverse effect of a cumbersome regulatory framework — notably planning and building regulations, zoning restrictions (including on height), standards and administrative procedures — on the cost and speed of expanding formal low-cost housing.[12]

12. On the other hand, slum upgrading and integration have replaced the eradication of slums and relocation of slum dwellers, which has often destroyed large stocks of affordable housing and merely displaced slum dwellers from one informal settlement to another. Investments in shelter and infrastructure and the provision of basic services, including water and sanitation, in combination with measures to secure land and housing tenure for slum dwellers, are at the core of slum upgrading and regularization programmes in many developing countries. In a number of cases, slum upgrading and tenure regularization have been successfully combined with poverty reduction schemes such as employment creation, improved access to credit and community housing initiatives.

13. Several success stories have been recorded: progress in most of North Africa towards improvement of slum settlements; the Tondo Urban Development Project in the Philippines that transformed the largest slum in Manila (and one of the largest in Asia) over a period of 10 years into an upwardly mobile neighbourhood; slum upgrading programmes in several hundred municipalities in Brazil (see box 1); and slum upgrading in Yemen and Jordan, to name just a few.

Box 1

Slum upgrading in Brazil

In Brazil, several hundred municipalities have slum-upgrading programmes, often with some form of land tenure regularization, and with strong emphasis on participatory budgeting and investment planning. For tenure regularization, some municipalities have used an innovative legal instrument called "concession of the real right to use". Settlements granted such rights have had improved access to private and public investment in housing and infrastructure and have become better integrated with adjacent areas.

Source: Report on sustainable human settlements development and management prepared for the twelfth session of the Commission, December 2003, p. 9.

B. Adequate shelter for all

14. Efforts to improve the lives of slum dwellers are part of broader efforts towards adequate shelter for all, which has been recognized as a basic human right. An increasing number of countries have taken steps in this direction, revising national legislation to include provisions concerning the right to housing and translating those provisions into strategies and programmes. Recent years have seen the development of a large number of national shelter strategies and programmes,

with emphasis on slum upgrading, tenure security and the integrated provision of services and infrastructure.

15. A recent UN-Habitat report[13] finds that national housing policies and donor-supported housing programmes are generally neglectful of the role that rental housing can play as a form of affordable shelter for the poor. There is a heavy emphasis in most policies on facilitating home ownership, despite the fact that many families and individuals avail themselves of (or would choose to avail themselves of) rental housing during some part of their life cycle. Rental housing may be especially well-suited to the needs of newly formed households with small children, whose accumulated savings and current savings capacity may be limited. Data compiled by UN-Habitat indicate that rental of housing represents more than half of tenure arrangements in several major cities of North and East Africa, a third or more in several Asian cities and a fifth to a quarter in several major Latin American cities; in major developed country cities it often represents around half of tenure arrangements. Broadening policy would, for instance, involve recognition that, alongside residents of informal settlements, rental tenants may also face insecurity of tenure.

16. In African countries, the right to housing has been reflected in various forms in housing policies or legislation. In South Africa (see box 2) and Namibia, adequate housing has been included in the constitution as a human right. Egypt recently reinforced the rights of individuals and families to adequate housing, secure tenure, and infrastructure and services. In Mali, the protection of tenants from arbitrary eviction is guaranteed by government decree. In addition, many Governments have developed comprehensive national shelter strategies or have revised and strengthened such strategies. Housing policies of some African countries have also addressed gender equality. Chad's national housing policy, for example, has established a 50 per cent access quota for households headed by females to serviced plots.

Box 2
Meeting housing needs in South Africa

South Africa's constitution provides for housing as a right. The country's national shelter strategy specifically targets low-income households by extending subsidies for the purchase of secure plots, installation of water and sanitation services, and construction of a basic shelter. This strategy resulted in the construction of 1.5 million new housing units between 1994 and mid-2003, with a further 300,000 housing units currently under construction.

Source: Report on sustainable human settlements development and management prepared for the twelfth session of the Commission, December 2003, p. 9.

17. Nevertheless, few countries in Africa have been able to implement fully their shelter strategies as planned owing to a lack of resources and capacities, in particular at the local level, and a lack of coordination between the various institutions responsible for shelter. Price increases in the construction sector have also been an obstacle, with formal sector housing affordability, even to the middle class, remaining a key concern.

18. In Latin America and the Caribbean, the right to adequate housing is enshrined in many national constitutions, providing the legal underpinning and framework for addressing this issue through national shelter strategies. National housing policies in the region include a broad spectrum of interventions ranging from legalizing tenure to integrated housing improvement schemes, often with particular subsidy provisions for low-income families. Most countries are also implementing new legislation to improve the situation of homeless people. Legal security for renters is ensured in almost all countries in the region, although "informal" renters remain at high risk of eviction.

19. Despite these efforts, serious housing problems persist in the region, especially among poor people. The supply of public and private housing did not expand substantially in the 1990s. ECLAC has estimated new housing needs at approximately 38 million units. There is also demand for replacement of the existing housing stock, especially of low-income housing. Among poor households, the most widespread problems observed are lack of access to sanitation and drinking water networks and insecure tenure.[10]

20. Most Governments in the Asia-Pacific region recognize housing as an essential right, and a variety of shelter strategies have been adopted. The region has seen some shift in social housing policy towards private sector provision of low-cost housing, with Governments shifting towards an enabling role, promoting public-private partnerships and encouraging the involvement of civil society groups. The Philippines, India, Sri Lanka, the Republic of Korea and Bangladesh, in particular, have substantially increased their emphasis on decentralized private sector delivery. Singapore stands out for its success in using a State-owned company to provide affordable housing to most of the population (see box 3). In some countries, such as Malaysia and Indonesia, the provision of housing is carried out through planning regulation, requiring developers to set aside a proportion of housing units for low-income residents. China's shelter policy, based on housing market reform and social housing construction, has resulted in an improvement in living standards for many people across most income strata. The 1997-1998 economic crisis slowed the strong progress in Asia in the preceding years.

Box 3
Public housing in Singapore

Singapore has been particularly successful in providing mass, affordable public housing. Singapore has entrusted a Housing Development Board (HDB) with extensive powers for all aspects of its public housing programme, including land acquisition, resettlement, town architectural design, engineering work and building-material production, except for the fixing of the sale and rental prices of the housing units, which is undertaken by the Ministry of National Development. To keep the price of housing units well below the market rate, the HDB is supported by public funds, but HDB essentially operates as a private developer. Today 85 per cent of the population lives in publicly supplied housing, up from 20 per cent in the 1960s, and 95 per cent of Singaporeans own their dwellings.

Source: http://tcdc.undp.org/tcdcweb/experiences/vol4/Public%20housing.pdf.

21. While there is growing recognition in the West Asia region that housing is a basic right, that right is still not translated into action in most countries, and poor security of tenure among vulnerable urban residents remains a problem in many countries. Some Governments have undertaken legislative reviews and amended existing legislation or promulgated new legislation in favour of the poor. In the Gulf Cooperation Council area, for example, legislation now guarantees housing for all citizens as well as access to low interest loans and grants for housing construction.[14]

22. The right to housing is recognized in many countries of the ECE region and addressed in most cases under legislation covering real estate, property and housing loans. Housing reforms in the last decade have emphasized market forces and reduced State intervention, resulting in increased private homeownership. State-subsidized rental housing, while declining, continues to play an important role in the ECE region in providing access to reasonably priced housing for low-income people or needy families, through various forms of rental support schemes. The role of civil society, which is traditionally strong in much of the ECE region, is increasingly being recognized in housing-related legislation.

23. Countries with economies in transition are struggling to make housing markets work more effectively and equitably. Housing markets in these countries are becoming increasingly commercialized and social protection has declined. Owing to a lack of tenure security and arrears on housing loans, an increasing number of households in several Eastern European countries are facing the threat of foreclosure or eviction.[15] The pressing issue in this region therefore is to develop government policies to ensure that the private sector fills the demand for new and improved housing, without jeopardizing the housing rights and welfare of the poor and vulnerable and without creating a new class of slum dwellers.

C. Access to land and land use planning

24. Essential to the realization of the right to housing is improving access to land for affordable housing development. Land acquisition costs for building dwellings can often be prohibitive for the landless poor, especially in fast-growing cities. In many instances, land ownership is highly concentrated in private hands, and property development schemes are often targeted at high- and middle-income households, especially in the more accessible locations. Affordable land where low- and moderate-cost housing might be built is often distant from city centres and, without adequate transport links, the residents of such peri-urban communities face long commutes to their jobs. They are also often disconnected from urban infrastructure. Even publicly owned lands in or near city centres may not be readily available for low-cost housing development, as Governments — or specific ministries or public companies controlling those lands — weigh this potential use against more lucrative alternatives. Real estate market speculation — fuelled by rapid urbanization and economic growth and, in some cases, by financial globalization — has intensified pressures in some cities for eviction of squatters from well-located land that was previously of little value.[16] Only a Government strongly committed to a shelter-for-all policy is apt to forego significantly higher return uses in order to provide low-cost housing on such high-value land. A proactive policy of acquiring low-cost land on the urban periphery to set aside for future low-cost housing development is one option Governments may wish to consider.

25. National land use policies of developing countries are often based on the twin goals of promoting geographically balanced urbanization and reducing rural-to-urban migration and the resulting increases in slum populations by improving rural living conditions and promoting rural development. Promising initiatives include regularization of land tenure to provide secure access of rural families to productive land, small-town upgrading programmes such as Botswana's village improvement scheme, and planned peri-urban expansion encouraging the growth of satellite towns beyond traditional city limits, such as has been promoted in some Indian cities. Most countries have established central and local land administrative bodies in both rural and urban areas to carry out responsibilities and functions related to land use planning and the implementation of measures related to land titling and land ownership. Modernizing land administration systems has not always resulted in greater transparency, and many developing countries still lack access to modern technology as a tool for improved land use planning and management, especially at the local level. Land development processes still tend to serve the middle- and higher-income classes, forcing the poor to settle on marginal lands, often in areas at risk from environmental hazards and without access to basic services.

26. To address problems of land access and tenure security, a number of countries in Africa have undertaken formal land titling projects to improve access to land for the poor and to protect land users from unlawful eviction. Mozambique, for example, has implemented a new law that protects communities from being dispossessed of the land on which they have enjoyed traditional customary use. In Benin, a dynamic system of customary tenure has been adapted to urbanization and become partially integrated into formal procedure. Some countries are giving legal recognition to customary tenure systems and control by customary institutions over access to land. On the other hand, difficulties in land tenure regularization arise in some cases when formal legal systems coexist, and sometimes conflict, with customary systems of land ownership — a situation common in Africa.[10]

27. Next to North America, Latin America and the Caribbean is the most urbanized region in the world. Access to land and land use planning are being addressed as part of major reforms in urban development policy aimed at strengthening linkages between urban planning and territorial regulation at the provincial level, integrating housing needs, land use, and infrastructure development. Reform efforts in the region have been translated into a wider range of innovative management approaches and practices, including strategic urban projects, public-private partnerships, participatory budgeting and economic instruments. Some countries have introduced legislation to improve land tenure security. Bolivia, for example, has created a new legal basis for land ownership and land distribution, and Chile has passed a new law on land property rights. However, the scarcity of urban land and the speculative nature of land markets have considerably increased land prices in large cities. Furthermore, high and growing income disparities have exacerbated inequalities in access to land, further marginalizing the poor in urban land markets and effectively condemning them to be perpetual slum dwellers.[17]

28. Access to land for all remains a fundamental goal in almost all countries in Asia and the Pacific. Some Governments address this issue as a priority in policies and legislation on land administration and urban planning. Thailand and Sri Lanka, for example, have implemented land titling and registration projects; Nepal has used leasing arrangements to provide access to land for poor people, the landless, women and tribal people; and the Republic of Korea has revised its inheritance law to

enable women to enjoy equal rights to the inheritance of land. In some small island developing States in the region, the customary nature of the control and ownership of land and the critical role that customary tenure systems have in land and resource conservation are being recognized and taken into account in land use planning and management.

29. Across the ECE region, Governments have improved land administration by creating spatially integrated, efficient markets for housing, land, and public transport. Effective strategies for urban regeneration to create employment opportunities, recycle brown-field sites and improve infrastructure have included new planning models and instruments that address physical deprivation, social exclusion and environmental degradation together.[15]

30. In most countries with economies in transition, Governments have carried out extensive land privatization. In the Russian Federation, for example, over 50 million people and legal entities have acquired private ownership of land. Central and Eastern European countries have adopted strategic regional planning practices, with varying degrees of success. As in other regions, pressure on land due to the scarcity of urban land and the speculative nature of land markets has considerably increased land prices in large cities.

D. Provision of services and infrastructure

31. Recognition of the right to housing and access to land, while essential, will not by itself improve the lives of slum dwellers. To mitigate the crushing impact of poverty and social exclusion and unhealthy living conditions in slums, basic services and infrastructure must be provided, whether through targeted slum upgrading and shelter programmes or as part of urban renewal and development. Typically, these interventions cover connections to water and sanitation facilities, electricity, transportation, telephone, and health and education. However, Governments in developing countries are seriously constrained in the provision of such services and infrastructure by lack of resources. Cities in developed countries on average spend on infrastructure and urban services 32 times as much per person as cities in least developed countries. In slum areas in developing countries, connections to networked infrastructure and services are by and large half of the city average, which are inadequate to start with. Prospective private infrastructure providers are often deterred by insecure property rights of inhabitants and the problems of fee collection. The level of sewerage coverage is particularly low, with only about 7 per cent of households in informal settlements in sub-Saharan Africa and Asia and the Pacific connected to sewer systems. The sewerage coverage for informal settlements in North Africa and the Middle East and Latin American and the Caribbean is about 22 and 30 per cent, respectively.[6]

32. The percentages of households with a piped water connection in informal settlements are slightly better but remain low, ranging from a high of 58 per cent in Latin America and the Caribbean to a low of 19 per cent in sub-Saharan Africa. In between are Asia and the Pacific and North Africa and the Middle East, with 38 and 36 per cent respectively.[6] As in-depth reviews of water and sanitation are made in separate reports, this section focuses on the provision of energy, waste management and transportation services.

1. Access to energy

33. Progress with energy development will be reviewed in detail by the Commission at its fourteenth session, so this section provides only a broad overview of the status of energy access in human settlements, notably in poor communities. Throughout the developing world, efforts are under way to expand electrical grids and to improve access to modern energy services, including in slum areas. In sub-Saharan Africa, only 20 per cent of households in slum areas have access to electricity, while in North Africa and the Middle East, the corresponding figure is 36 per cent. In Asia and the Pacific and Latin America and the Caribbean, households in informal settlements have better access to electricity, with about 76 and 85 per cent of them, respectively, having electrical grid connections.

34. Overall, in the developing world, approximately 1.6 billion people remain without access to electricity, and some 2.4 billion people — more than half the population of developing countries — still rely on traditional biomass fuels (wood, charcoal, animal dung and crop wastes) for cooking and heating, typically in open fires or low-efficiency stoves with inadequate venting. The health implications for the rural poor and slum dwellers often compound their daily struggle. Exposure to biomass smoke increases the risk for a range of common and serious diseases, the most important of which is acute respiratory infections, such as pneumonia. According to WHO, almost 4 million people die every year from acute respiratory infections, with over 90 per cent of the cases occurring in developing countries. While there has been little systematic evaluation of the health impacts of improved cook stove interventions, evidence from several hundred improved cook stove programmes in over 50 developing countries suggests that they are both health-improving and cost-effective.[18]

2. Solid waste management

35. The volume of solid wastes has considerably increased in all regions and their composition has changed with more non-biodegradable waste and an increasing amount of toxic waste. Improperly managed solid wastes can pose a health hazard, particularly in urban areas, as a breeding ground for disease and a source of contamination of water supplies. Uncollected garbage, along with excreta, are often disposed of in drainage ditches, which can become clogged. When wastewater and storm runoff cannot be easily drained, flooding spreads waste and excreta through the surrounding area. Microbial and chemical contamination of water resources often occurs where solid waste disposal is not adequate.

36. A recent UN-Habitat survey of major cities[6] indicates that large sections of the urban population in developing countries, and particularly those living in informal settlements, lack access to an adequate public system of solid waste removal. The survey also shows that larger cities are more likely than smaller and medium-sized ones to be equipped with waste collection and disposal facilities.

37. In most African cities, only 10 to 30 per cent of all household solid wastes are regularly collected, and services are inevitably most deficient for slum dwellers. In the absence of organized waste management systems, some waste collection and recycling is provided by poor people and informal enterprises when it provides an economic opportunity. Organization of these informal activities to improve economic opportunities, expand waste collection and recycling, and reduce health and safety hazards, is a strategy that is increasingly being adopted as part of

municipal waste management programmes, often in cooperation with non-governmental organizations and sometimes with donor funding (see box 4).

Box 4
Waste collection in Dar es Salaam

Faced with the challenge of providing basic services to a rapidly expanding population, the Dar es Salaam City Council in the United Republic of Tanzania opted for involving community groups and microenterprises in citywide solid waste collection. A transparent tender system and community mobilization campaigns were established, and selected groups and companies were provided with technical and business management training. As a result, the city is kept clean and thousands of jobs have been created.

Source: Contribution of ILO to the twelfth session of the Commission.

38. In Latin America and the Caribbean, cities use both sanitary landfills and open dumps to dispose of solid wastes. Only a few countries in the region, notably Brazil, have made advances in reuse, recycling and energy recovery from incineration. Most countries in the region lack infrastructure for environmentally sound disposal of solid wastes, as well as managerial capacity to address solid waste management effectively. Lack of separation of hospital and industrial wastes from household wastes also remains a serious problem. While some countries in the region have adopted laws concerning the control and disposal of hazardous waste, they do not have the facilities to treat, recycle or dispose of them; nor do they have the resources to enforce legal regulations. As a result, a large portion of hazardous waste is illegally dumped, often in the vicinity of slums or in locations where it risks contaminating water supplies.[17]

39. Cities in Asia make greater use of environmentally sound solid waste disposal systems, particularly in the more developed countries of the region, such as Japan and Singapore. Disposal by open-air burning is less common than in African cities. In some West Asian countries, the gradual institutionalization of informal sector activities in solid waste collection and recycling has been accompanied by increasing privatization of solid waste management services. However, the resources allocated to solid waste management remain inadequate, as indicated by country reports from the West Asia region, and national laws, regulations and standards related to the sustainable management of solid wastes need improvement.[14]

40. While some small island developing States have made progress with improving solid waste management policies and practices, many still face considerable difficulties in terms of financial and technical capacity, compounded by a lack of available space for landfills. Waste minimization, recycling and reuse are therefore particularly appropriate strategies for their special circumstances. Growing concern has been raised with regard to the security and environmental implications of the disposal and transport of radioactive materials in the small island developing States regions and through their territorial waters, and the lack of liability and compensation regimes.[19]

41. Western European and North American countries generally have efficient and cost-effective solid waste management systems with increasing emphasis on the three "Rs" — reduction, reuse, and recycling. Some Western European countries use economic incentives such as fees on beverage containers and single-use shopping bags, as well as producer take-back requirements for end-of-life products and packaging regulations. Solid waste management in Eastern European countries continues to be problematic. Recycling practices are at a rudimentary stage, and many cities rely heavily on open landfills, which are often poorly maintained.

3. Implementing sustainable transport solutions

42. Private vehicle ownership is growing rapidly in fast-growing developing countries, posing major challenges to urban transport planners and creating serious pollution and congestion problems. Recent years have seen considerable efforts to develop strategies to integrate transport planning with land use planning and human settlement development. Access to transport services by slum dwellers has improved in some developing countries, facilitating access to employment, health care and other basic services, as well as promoting social interaction.

43. Many cities in Africa are emphasizing affordable and more environment-friendly means of transportation. Egypt, for example, has made large investments in its public subway and bus networks, benefiting slum dwellers, and has also moved to unleaded gasoline. Other countries in the region offer low fares to facilitate access of the poor to public transport. However, overlapping jurisdictional responsibilities among agencies involved in transport planning and urban development continue to plague the sector, aggravated by a sectoral approach taken by many city planners and managers, in which transport is treated as a separate issue rather than an integral part of urban planning and management.

44. In Latin America and the Caribbean, some cities, such as Bogota (see box 5), have developed rapid transit bus systems together with infrastructure to facilitate non-motorized transportation. Brazil has promoted the use of alcohol derived from sugar cane as a transport fuel, contributing to the reduction of carbon dioxide emissions by approximately 16 per cent. Nearly all Latin American countries have plans to eliminate lead from gasoline, but sulphur, particulates and other urban air pollutants remain high in many countries.

Box 5
Sustainable transport solutions in Bogota

Following reorganization of an outdated, polluting and chaotic system of privately run buses into a streamlined network of diesel vehicles compliant with Euro II standards, Bogota's new TransMilenio public transport system began operation in December 2000, including exclusive bus-ways with design features similar to that of an urban rail system. By 2003, the TransMilenio system — operated in cooperation with private bus contractors — was providing more than 540,000 trips a day in Bogota, 9 per cent of which were trips formerly made by car. A 20 per cent petrol surcharge helped the city finance infrastructure investment, while a car tag system was instituted to limit private automobile travel during peak hours. Bogota also developed more than 300 kilometres of protected bicycle paths, and launched a campaign to move cars off sidewalks, returning that space to pedestrians, vulnerable groups and low income households, who rely on those spaces for exercise and leisure.

Source: Colombia country report submitted to the United Nations, 2003.

45. Many Asian countries have implemented measures to reduce transport-related urban air pollution, but problems remain with old vehicle fleets, dirty fuels and traffic congestion, as well as noise. Large investments have been made in public transport, with new or extended mass transit systems opening or under construction, for example in Kuala Lumpur, New Delhi, Manila and Jakarta, providing affordable transportation for low-income people. Some countries in Asia have adopted more stringent environmental standards for new cars as well as cleaner fuels. China, for example, is adopting strict vehicle fuel economy standards to save energy and to encourage a switch to hybrid vehicles. China has also initiated a successful vehicle inspection programme to reduce the environmental impacts from transportation.[16]

46. Industrialized countries of the ECE region have well-developed public transport systems and the use of cleaner fuels in public transport is increasing. Many Western European countries subsidize fares for public transportation, especially for students, the elderly and the disabled. Measures have been undertaken at all levels of government towards linking land use planning and transport planning. Eastern Europe has seen significant growth in private vehicle use, partly as a result of poor and declining standards of municipal transport, and partly as a result of rising incomes.

E. Employment creation and enterprise promotion

47. Provision of basic services and infrastructure to informal settlements — integrating their inhabitants more fully into the urban economy — is essential to improving the living standards of slum dwellers. Sustainable long-term improvement in slum conditions will depend on tackling poverty. This in turn requires the creation of remunerative jobs for low-skilled workers and of an environment conducive to entrepreneurship. Governments in developing countries

are contending with a variety of constraints in job creation and income generation. Lack of entrepreneurial skills and managerial capacity in enterprises — compounded by inadequate infrastructure and an uncertain, overly bureaucratic business environment — continues to limit investment and productivity growth in many countries.

48. In response, many Governments have focused on the role of small enterprises and microenterprises in their employment policies. Promoting self-employment and the informal sector will continue to play an important role in creating employment opportunities, as growth in job opportunities in the formal sector is not expected to match urban population growth.[20] The implementation of credit schemes, including microcredit, for small local businesses and cooperatives is a key component. For Governments, creating both the macroeconomic and regulatory conditions that would encourage a dynamic formal enterprise sector will remain a high priority, not least if Governments are to generate tax revenues to finance essential infrastructure and public services.

49. In Latin America and the Caribbean, Governments have adopted national programmes to provide credit, training and technical support to small enterprises, which often count slum dwellers among their employees. The scope of such programmes remains limited, however, to a small proportion of prospective beneficiaries and additional resources would be needed to cover more enterprises. Such support has strengthened these enterprises as buffers against the social and economic impact of structural adjustments and financial crises on labour and production, though it has not always helped poor people become successful participants and competitors in the formal economy. Some West Asian countries have undertaken initiatives to support micro, small- and medium-sized enterprises through entrepreneurial capacity-building and incubation programmes. Several Governments in Africa, including Kenya, Angola, Guinea and Morocco, are developing or implementing similar microenterprise support policies, some specifically targeting women. In Viet Nam, integrated small enterprise promotion has become the main strategy by which provincial governments are tackling unemployment and poverty reduction. Measures include entrepreneurship training, job quality promotion, association building and market access improvement.

F. Human settlement development in disaster-prone areas

50. Over the past decade, some 200 million people a year have been affected by natural disasters and the impacts have been increasing. In the 1990s, the economic costs of natural disasters were 14 times greater than in the 1950s. For 2002 alone, the occurrence of over 500 disasters was reported, with 25,000 people reported killed, 608 million people affected and costs of about $27 billion in total damages.[21] The location of many human settlements near coasts or on major rivers makes them vulnerable to disasters. Within cities, sub-standard housing, overcrowding and the location of informal settlements on marginal lands make slum dwellers particularly vulnerable.[22]

51. Designing and building hazard-resistant buildings and other structures is among the most cost-effective means of risk reduction. However, owing to the additional costs, buildings and infrastructure are often not built according to codes designed to minimize damage from extreme climatic or natural phenomena.[17] In

informal settlements, enforcement of building codes and zoning laws is unlikely to be effective, especially in the absence of secure tenure arrangements. In the long run, a viable solution to disaster management lies in integrating disaster risk reduction into sustainable shelter planning and human settlement development. Decentralization of authority and resources from central to municipal and local levels is increasing, and municipalities have begun to take a more proactive role in making risk management a priority issue on local human settlement agendas.

52. Disaster mitigation and management can benefit from new information and communication technologies, which have considerably increased the availability of information about natural disasters. Improvements in global observation systems have made possible the early detection of climatic conditions such as El Niño events and are contributing to early warning of other events, including those related to climate change. They are also providing better tools for near-term forecasting and prediction, including seasonal forecasts, and better monitoring and modelling of disaster related factors.

53. Small island developing States remain extremely vulnerable to natural and man-made disasters, and scarce resources continue to be diverted from other social, economic and infrastructure programmes to respond to these disasters. Most small island developing States now have draft disaster management policies and programmes, and some have developed early warning systems and hazard mitigation policies, including national and regional oil spill contingency plans. However, national capacity is unlikely to be sufficient to cope with the increasing frequency of extreme weather events and the costs associated with reconstruction, in spite of the existence of special funds in some countries. There is a need for further resources for the development of national disaster mitigation capacities and the creation of appropriate insurance and reinsurance schemes for small island developing States. Regional disaster-preparedness and risk reduction initiatives include the establishment of the Caribbean Disaster Emergency Response Agency and the Coordination Centre for the Prevention of Natural Disasters in Central America. The forthcoming 10-year review of the implementation of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States will review these issues in detail.

IV. Means of implementation

A. Finance

54. Improving the lives of slum dwellers will contribute to progress in meeting other Millennium Development Goals and time-bound targets and commitments of Agenda 21 and the Johannesburg Summit. The challenge Governments face is a daunting one: simply improving the conditions of 100 million slum dwellers would only amount to a "managed retreat";[23] given the projected growth in urban slum populations over the next few decades, much more is needed to achieve real progress towards sustainable human settlements. The dual challenge facing Governments is to promote a sufficiently rapid expansion of the formal low-cost housing stock to slow and eventually halt slum expansion — Chile, Costa Rica and El Salvador having made substantial progress in this regard — while also facilitating the upgrading of existing slums.[24]

55. While every effort is needed to maximize the efficiency of resource use, the financial resources needed are inevitably going to be very substantial. Providing water, sanitation, electricity, health care, transportation, education and other basic services and infrastructure for rapidly growing numbers of slum dwellers and other urban inhabitants will entail large capital investments. A World Bank estimate based on the situation a decade ago suggests that the total investment required from public and private sources for urban infrastructure is about $150 billion a year.[6] Additional official development assistance will need to flow into human settlements development if there is to be any possibility of meeting the dual challenge.

56. The picture of domestic finance is not altogether reassuring. Governments continue to account for the bulk of urban infrastructure investments. While tax revenues have remained broadly stable as a share of gross domestic product in major developing regions, gross domestic product itself has grown only slowly if at all in many countries — China and India being major exceptions. Decentralization has not always transferred to lower levels of government the revenues — or revenue-raising powers — to perform effectively their new responsibilities. Moreover, despite their heavy infrastructure investment needs, municipal governments have not had ready access to financial markets. Besides underdeveloped domestic capital markets, other obstacles include: municipal governments' lack of a financial track record; investor reluctance to invest long-term when faced with short electoral cycles; inadequate public disclosure guidelines; and a perceived lack of autonomy of municipal government to raise revenues. Despite these factors, municipal bond markets developed briskly during the 1990s in some countries of Latin America and Asia, as well as in some European economies in transition. It is estimated, for instance, that through the 1990s some 52 municipalities and provinces in Latin America accessed capital markets, and the Asian local bond market in the late 1990s was valued at almost half a trillion dollars.[25] International investor interest in such markets remains weak, however.

57. With stagnation in real official development assistance and slow domestic revenue growth during the 1990s, many Governments have looked to private investors to fill part of the financing gap for urban infrastructure. As the companion papers on water and sanitation explain, the experience with private provision of those services has generally not lived up to expectations, with private suppliers still accounting for a small share of the total and private investment trailing off from the late 1990s. A number of countries have also sought to attract private investment into other infrastructure, notably energy, telecommunications and transport. Here again, experience has been mixed. In the first two, technological change has substantially reduced fixed costs and the importance of scale economies, making competitive supply feasible. Strong regulatory frameworks are needed, however, to make competition effective. In the period 1995-2002, the energy sector attracted the largest amount of investment involving private sector partners — some $118 billion in facilities investment — while telecommunications came a close second with $109 billion, and the transport sector attracted $75 billion in projects with private participation (mostly seaports and toll roads, with other types of roads still largely dependent on public investment).[26]

58. With respect to housing finance, in the broadest terms the housing market can be divided into three segments: that portion of households that can access the mortgage market and/or draw upon substantial savings to purchase their own homes; another portion — generally more sizeable in low- and moderate-income

countries — that may be able to finance home purchase but only with an element of government subsidy, whether as a lump-sum grant towards a down payment or as an interest rate subsidy; and a third group of households, generally poor and often living in informal settlements, who are largely excluded from formal housing credit markets and must rely on small-scale credit from informal sources and/or microfinance institutions, to make incremental extensions and improvements to their dwellings. Research on the housing market in three major Brazilian metropolises[27] estimates that, of the 1 million households that enter the market for shelter each year, only 20 per cent can afford to finance down payments out of their own savings and take out mortgages on commercial terms (with monthly payments estimated at greater than 10 times the minimum wage); another 10 to 20 per cent enjoy access to the mortgage market with a government interest rate subsidy; and the remaining 60 to 70 per cent do not enjoy subsidies and simply cannot afford the down payment and monthly instalments of the formal market.

59. Most investment in the housing sector is privately financed,[28] although Governments maintain an important role in some countries in extending affordable housing to low-income households. Besides insecure property rights in many informal settlements, other factors that limit housing affordability include low income relative to the cost of land and construction; high standards and administrative costs of formal sector land subdivision and housing development; high real interest rates in some countries resulting from adverse macroeconomic conditions; and non-competitive financial sectors that face little pressure to lend to low-income borrowers.[11]

60. Low-income households depend to a large extent on informal credit sources, which are often expensive and short term.[29] Restrictions on women's access to land and inheritance rights have often precluded their access to credit.[30] Microcredit institutions — and even some commercial banks — are increasingly lending, often in multiple small tranches, to low-income borrowers for housing improvements (also frequently involving improved water supply and sanitation), which in low-income communities are often incremental, extending over many years through repeat borrowing.[31] The home loans tend to be somewhat larger on average than microenterprise loans and to carry lower interest rates.

61. Some African countries have tried to improve housing finance for poor people through community mortgage programmes and private sector finance. In Latin America and the Caribbean, housing finance schemes have been based on a combination of subsidies, private savings and mortgage loans. These schemes have increased access of low-income groups to housing, in particular in countries with relatively stable economies, but they have not often reached the poorest groups, including slum dwellers. The city of Rio de Janeiro, Brazil, has placed a heavy emphasis on slum upgrading, but the sheer magnitude of the problem poses a major challenge to resource mobilization. Thus far, a half million residents out of a total city slum population estimated at 1.7 million have benefited from the Favela-Bairro neighbourhood improvement programme, at a cost of US$ 600 million, more than half financed by a regional development bank loan. The city plans to invest another US$ 400 million to cover an additional 330 neighbourhoods.[32]

62. In Asia and the Pacific, housing finance is emphasized as one of the fundamental elements of urban development programmes. The Government of China, for instance, is investing roughly $20 billion a year in building housing for

low- and middle-income earners, though concerns have been raised that high-income earners may also be benefiting to some degree from subsidized public housing. With public housing finance institutions constrained by poor repayments, some Governments in the region have encouraged innovative schemes and non-governmental organizations and microfinance institutions have also taken the initiative. For example, in India, non-governmental organizations have set up guarantee programmes with commercial banks for financing housing in poor communities. From 1984 (when its home lending began) to the end of 2002, Bangladesh's Grameen Bank is reported to have disbursed 556,600 housing loans. In the Republic of Korea, the Government has established a framework for secondary mortgage markets to strengthen the commercial mortgage system.[10]

63. Some countries in West Asia have committed public financial resources to improve housing and infrastructure, while gradually but increasingly seeking private investment to supplement limited public financial resources. Financial instruments and mechanisms that have been used by countries in the region include low-interest loans, microfinancing and tax reforms.

64. In countries with economies in transition, private housing developers face financial difficulties, high inflation and lack of access to credit. While in the early reform period high interest rates stymied housing demand, the volume of mortgage lending has increased more recently in some Eastern European countries.[33]

65. In developed countries, incentive schemes have been in place to support public housing. In the United States of America, for example, federal and state governments provide a variety of tax credits and other financial incentives to make low-cost housing more accessible. In Canada, there is public financial support to non-profit borrowers for the development of affordable housing project proposals.

B. Decentralization in decision-making, participation and capacity-building

66. In addition to financial resources, capacity-building is a fundamental underpinning for successful implementation of human settlement policies and programmes. Capacity-building is needed, particularly in developing countries, at three levels that are equally important and mutually reinforcing — individuals, local institutions and the Government.

67. In Africa, most countries have adopted policies and legislation to increase local autonomy in policy-making and implementation. In many instances, provisions have been made to promote the engagement of civil society partners in decision-making, implementation and resource mobilization, for example through legal recognition of non-governmental and community-based organizations and the establishment of consultative mechanisms on urban development policies and programmes. Implementation of these policies and legislation is often slow, however, owing to the reluctance of central administrations to decentralize functions to the local level. Also, decentralization often takes place without adequate provision of the financial resources needed to perform the newly acquired functions at the local level.

68. The decentralization of functions to subnational government entities has proceeded at a fast pace in Latin America and the Caribbean, although there are

significant differences among countries in the degree of decentralization. The division of decision-making authority tends to be complex and often ambiguous. Central Governments often retain control over the allocation of resources for basic services, while the provision of these services is delegated to lower levels of government. Municipal governments and local authorities tend to depend heavily upon central Government transfers to finance the functions delegated to them, as locally generated funds are quite limited.

69. In Asia and the Pacific, policy changes to decentralize planning and administrative and decision-making power to local levels have been introduced into national legislation. Laws and regulations have been adopted governing the division of responsibilities and functions among central and local governing bodies in areas such as land use planning and management, urban development, infrastructure development, and provision of shelter and services. Decentralization is also gaining momentum in some West Asian countries, notably Saudi Arabia and the Syrian Arab Republic, strengthening local responsibility for development planning and implementation. However, while the legal and institutional framework is gradually strengthening, implementation and enforcement lag behind.[14]

Box 6
Civil society participation in India

In India, the role of non-governmental groups in shelter provision and development of community infrastructure is increasing, including through microcredit schemes for housing construction. Government programmes like the National Slum Development Programme and Swarn Jayanti Shahri Rozgar Yojana emphasize community-based thrift and credit societies.

Source: Report on sustainable human settlements development and management prepared for the twelfth session of the Commission, December 2003, p. 10.

70. All developed countries have strong central administrative bodies, such as ministries of housing, with responsibility for ensuring that housing and urban development policies are consistent with other national socio-economic and environmental policies, and also for allocating financial and other resources to local authorities. Based on a decentralized administrative structure, the main responsibilities and functions with regard to the planning, development and management of human settlements rest with provincial governments and local authorities. In Central and Eastern Europe, most countries have moved to decentralize political and administrative power, while in Commonwealth of Independent States countries, progress in structural adjustment and political reform has been slow and uneven.

V. Lessons learned and continuing challenges

71. Poverty consigns hundreds of millions of people in the developing world to harsh living conditions in urban slums, with inadequate shelter, poor water, sanitation and other infrastructure, high rates of unemployment, widespread disease

and physical insecurity. In many such communities, insecurity of land title limits capacity for financing upgrading of both housing stock and infrastructure. Even as Governments seek to improve the living conditions of the roughly 900 million people already estimated to reside in slums, they face the further challenge of securing the provision of affordable, decent shelter to the many million more low-income households that will be formed in urban areas over the coming decades. In short, they need to create a policy and institutional environment conducive to providing adequate shelter, infrastructure and services to an average 70 million new urban residents worldwide each year over the next 15 years — almost all in developing countries.[34]

Access to land, land-use planning, and tenure security

72. Securing access to land for affordable housing development poses a major challenge in many major cities of the developing world. Especially but not only where financial markets are underdeveloped, real estate can be among the few high-yield domestic investments, and expectations about future land price inflation can dampen considerably land market turnover. For those poor urban households not already possessing land, gaining access to it legally can prove unaffordable. Where Government does not itself control substantial land that can be used for housing development, high land acquisition costs also limit its capacity to provide low-cost housing. Urban land tenure reform is generally not addressed as an integral element of government measures to promote equitable access to land for human settlement development. Meanwhile, excessive regulation of land use can pose an obstacle to low-cost housing development.

73. For those living in urban or peri-urban informal settlements, lack of land titles and insecurity of land tenure are significant obstacles to financing improvements both in the housing stock per se and in the supporting infrastructure. Thus, much emphasis has been given in recent years to title regularization as part of slum upgrading programmes.

Provision of shelter, associated infrastructure and access to employment

74. The integrated provision of housing, infrastructure and services, with particular attention to slum dwellers, requires a strong commitment by central Governments and local authorities with strong community participation. While the main thrust of strategies is likely to favour home ownership, recent research stresses the important supporting role that expansion of affordable rental units can play in satisfying growing housing demand. There has been a noticeable trend towards privatization of the housing stock, especially in the countries with economies in transition, mostly through sale of rental units to their occupants. While this has significantly boosted home ownership in the short run, the long-term effects of privatization on the housing market, and in particular on housing affordability to the poor, are still not well researched.

75. To ameliorate conditions in existing slums, improvements to in situ infrastructure and services would need to be accompanied by stronger links — notably via efficient mass transit — of slum communities to the wider urban economy and, in particular, to centres of commercial and industrial activity. Without reasonably steady jobs and income, the residents of those communities will find sustained improvements in their living conditions elusive.

76. A policy and institutional environment conducive to new business formation, including an accommodating credit market, low minimum capital requirements, and ease of registration, can make a major contribution to employment generation, helping to lift slum dwellers out of the poverty trap. Rising real earnings in turn create an environment conducive to financing medium-term investments, for example, in major housing improvements. Ensuring continued adaptability in dynamic factor and product markets, not least through the ability to utilize new technologies, requires a commitment to education and training.

77. While urban dwellers generally enjoy far easier access to electricity and other modern energy services than do rural populations, biomass use for cooking and heating is still widespread in many cities of the developing world. High population densities ensure that the severe indoor air pollution problems associated with this type of fuel translate into severe outdoor air pollution as well, with widespread health consequences, especially for the poor who do not live, travel and work in air-conditioned environments.

78. Given the importance of transport as a vital component in the effective and efficient function of human settlements and from the many experiences cited, a continuous challenge to planners is to adopt a more integrated approach to transport planning, land use planning and human settlements development than hitherto. While the scope, scale and cost of transport infrastructure requires national planning and financial support, economic sustainability dictates that urban transport be operated, managed and regulated at the local level, and that there be local-level involvement in transport planning decisions. A major issue of concern for the foreseeable future remains the rapidly growing use of private vehicles among the middle- and upper-income groups in developing countries and countries with economies in transition as a preferred mode of local transport, with concomitant increases in air pollution, noise, traffic congestion and traffic-related accidents.

Limiting exposure of human settlements to environmental and natural disaster risks

79. Lack of infrastructure and institutional capacity to address solid waste management in an effective, efficient and environmentally sound manner and improper disposal of solid wastes, including hazardous waste, are major and growing problems for most cities in developing regions. As countries grow richer, solid waste volumes rise correspondingly, posing a disposal problem especially in areas where landfill sites consume scarce land. Facilities for safe incineration, meanwhile, require major investments. With industrialization also comes increasing volumes of hazardous waste. Urban poor communities are frequently situated in areas where the risk of human exposure to such waste as well as to accidents involving toxic chemical releases is relatively high. In many low- and middle-income countries, there is still no proper infrastructure for hazardous waste disposal, and policies to promote waste minimization and materials recycling are also often rudimentary.

80. The urban poor are frequently the most vulnerable to natural disaster risk, often inhabiting lands that are considered marginal by commercial developers, such as steep hillsides and river banks. Effective disaster mitigation and management requires integration of disaster risk reduction, including construction standards with effective enforcement, into sustainable shelter strategies and urban planning, as well as disaster preparedness systems.

Means of implementation

81. Provincial and municipal governments share with national Governments a significant part of the financing of infrastructure to support sustainable human settlements. While mechanisms for revenue sharing with the central government are generally in place, increased decentralization of governance structures has not always been accompanied by commensurate decentralization of revenue generation authority and/or augmentation of resource transfers. Local-level governments in Asia and Latin America have begun to make use of capital markets to raise revenue, but this source of funds is still rather limited even there and altogether lacking in many developing countries.

82. Without strong domestic economic growth and job creation, coupled with substantial resource flows to developing countries, financial constraints will remain a major impediment to improving the lives of slum dwellers and providing shelter and basic services for all. Achieving substantial improvements in the numbers of people with access to water and sanitation, energy and transport services requires significant public investment as well as continued involvement of the private sector and other non-governmental actors, in particular at the local level.

83. While building new housing stock is an activity that can be left largely to the private sector, governments still need to be concerned about the affordability of housing to the poor and those on moderate incomes. Mortgage interest rate subsidies (which are widely used even in developed countries) may be one effective means of encouraging broader home ownership. Lump-sum government grants to cover a portion of the housing costs of low-income households may be another. Measures are also needed to encourage expansion of the low- to moderately priced housing stock if upward pressures on housing prices are to be held in check.

84. The poor need to able to find housing finance that is tailored to their specific requirements, notably to make incremental housing improvements through repeat small-scale borrowing. Microfinance institutions are increasingly responding to this demand, but innovative approaches are needed to stimulate such lending by other financial institutions.

85. Strengthening the capacities of local authorities and other local stakeholders remains a continuing challenge in developing countries, given the complexity of the tasks that municipalities face with regard to land use management, infrastructure development and the provision of shelter and services.

Notes

[1] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992* (United Nations publication, Sales No. E.93.I.8 and corrigenda), vol. I: *Resolutions adopted by the Conference*, resolution 1, annex II.

[2] Resolution S-19/2, annex.

[3] *Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August-4 September 2002* (United Nations publication, Sales No. E.03.II.A.1 and corrigendum), chap. I, resolution 2, annex.

[4] Programme of Action for the Sustainable Development of Small Island Developing States (*Report of the Global Conference on the Sustainable Development of Small Island Developing States, Bridgetown, Barbados, 25 April-6 May 1994* (United Nations publication, Sales No. E.94.I.18 and corrigenda), chap. I, resolution 1, annex II).

[5] *World Population Prospects: The 2002 Revision*, 2003, and *World Urbanization Prospects: The 2001 Revision* (United Nations publications, 2002).

[6] *The Challenge of Slums: Global Report on Human Settlements 2003* (UN-Habitat publication, Sales No. 04.III.Q.1), 6 October 2003.

[7] *Global Environmental Outlook 3* (UNEP publication, 2002, p. 240).

[8] While there is still no internationally accepted definition of a slum, in November 2002 an expert group meeting in Nairobi agreed on a generic definition and recommended its use in assessing progress towards target 11 of the Millennium Development Goals on slum dwellers; in this definition, slums are characterized by: insecure residential status; inadequate access to safe water; inadequate access to sanitation and other infrastructure; poor structural quality of housing; and overcrowding. See Global Urban Observatory, *Improving the Lives of 100 Million Slum Dwellers: Guide to Monitoring Target 11* (UN-Habitat publication, May 2003, p. 6).

[9] Global Urban Observatory, *Slums of the World: The Face of Urban Poverty in the New Millennium?* (UN-Habitat publication, 2003).

[10] *Report on sustainable human settlements development and management*, prepared for the twelfth session of the Commission, December 2003.

[11] B. Ferguson and J. Navarette, "A financial framework for reducing slums: lessons from experience in Latin America", *Environment and Urbanization* (International Institute for Environment and Development publication), vol. 15, No. 2, October 2003.

[12] See, e.g., Geoffrey Payne, "Getting ahead of the game: A twin track approach to improving existing slums and reducing the need for future slums", paper presented at the Second World Bank Urban Research Symposium: Urban Development for Economic Growth and Poverty Reduction, 15-17 December 2003.

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[14] *Arab Region State of Implementation Report on Human Settlements for the Twelfth Session of the Commission on Sustainable Development* (ESCWA publication, October 2003).

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[16] *Cities in a Globalizing World: Global Report on Human Settlements 2001* (UN-Habitat publication), 2001.

[17] *Latin America and the Caribbean Preparatory Process for the Twelfth Session of the Commission on Sustainabl Development: Sustainable Human Settlements Development*, (ECLAC document LC/IN.139), 4 December 2003.

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[19] Draft summary report of regional preparatory meetings of the small island developing States prepared for the 10-year review of the implementation of the Barbados Programme of Action for the Sustainable Development of small island developing States, December 2003.

[20] Background paper on employment and human settlements prepared for the twelfth session of the Commission (ILO publication), October 2003.

[21] *World Disaster Report 2003* (International Federation of Red Cross and Red Crescent Societies publication), 2003.

[22] Somewhat ironically, natural disaster risk in high-income countries can be more equitably shared (or even biased towards higher-income households), as the same sorts of vulnerable properties — steep hillsides, river banks, seashores — become prime residential real estate for the wealthy. Naturally, higher construction standards limit to some extent the risks to th.. rich.

[23] The term comes from Geoffrey Payne, "Getting ahead of the game: A twin track approach to improving existing slums and reducing the need for future slums", paper presented at the Second World Bank Urban Research Symposium: Urban Development for Economic Growth and Poverty Reduction, 15-17 December 2003.

[24] There is some evidence to suggest that encouraging formal sector investment in new affordable housing developments is apt to be substantially less costly to Governments than dealing with slum upgrading after the fact. For instance, a city housing agency in Bogota estimates that, after land costs, the basic infrastructure package for upgrading informal settlements costs three times that of formal sector development. In addition to infrastructure costs, the Government must reorder settlements by straightening roads, leaving space for communal facilities, and thus relocating a portion of households: 2000 study by the Alcaldia Mayor de Bogota, cited in B. Ferguson and J. Navarette, "A financial framework for reducing slums: lessons from experience in Latin America", *Environment and Urbanization*, (International Institute for Environment and Development publication), vol. 15, No. 2, October 2003.

[25] *World Development Report 1999/2000* (World Bank publication, 1999).

[26] Data are from the World Bank's Private Participation in Infrastructure Project Database: http://rru.worldbank.org/PPI/reports/AggregateReport.asp?report=106.

[27] V. Serra, D. Dowall, and D. Motta, "An Empirical Study of Land Markets and Land Policy in Three Brazilian Metropolitan Areas", presented at the second World Bank Urban Research Symposium: Urban Development for Economic Growth and Urban Poverty Reduction, 16 December 2003.

[28] Overseas remittances can also be an important source of housing finance in some countries (although not necessarily for the poorest).

[29] In countries with large inflows of overseas workers' remittances, these can be a significant, low-cost source of finance for home improvements.

[30] *Sustainable Development in a Dynamic World: World Development Report 2003* (World Bank publication), 2003, p.10.

[31] See M. Malhotra, "Financing her home, one wall at a time", *Environment and Urbanization* (International Institute for Environment and Development publication), vol. 15, No. 2, October 2003. See also the five case studies of microfinance lending for housing improvements at: http://www.citiesalliance.org/citiesalliancehomepage.nsf/Attachments/synthesis+civis/$File/Synthesis+CIVIS+April03.pdf.

[32] See http://www.citymayors.com/report/rio_favelas.html.

[33] Background report on human settlements prepared by ECE for the twelfth session of the Commission, October 2003.

[34] Based on projections in *World Urbanization Prospects: The 2001 Revision* (ESA/P/WP.173).